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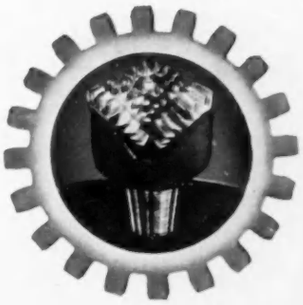

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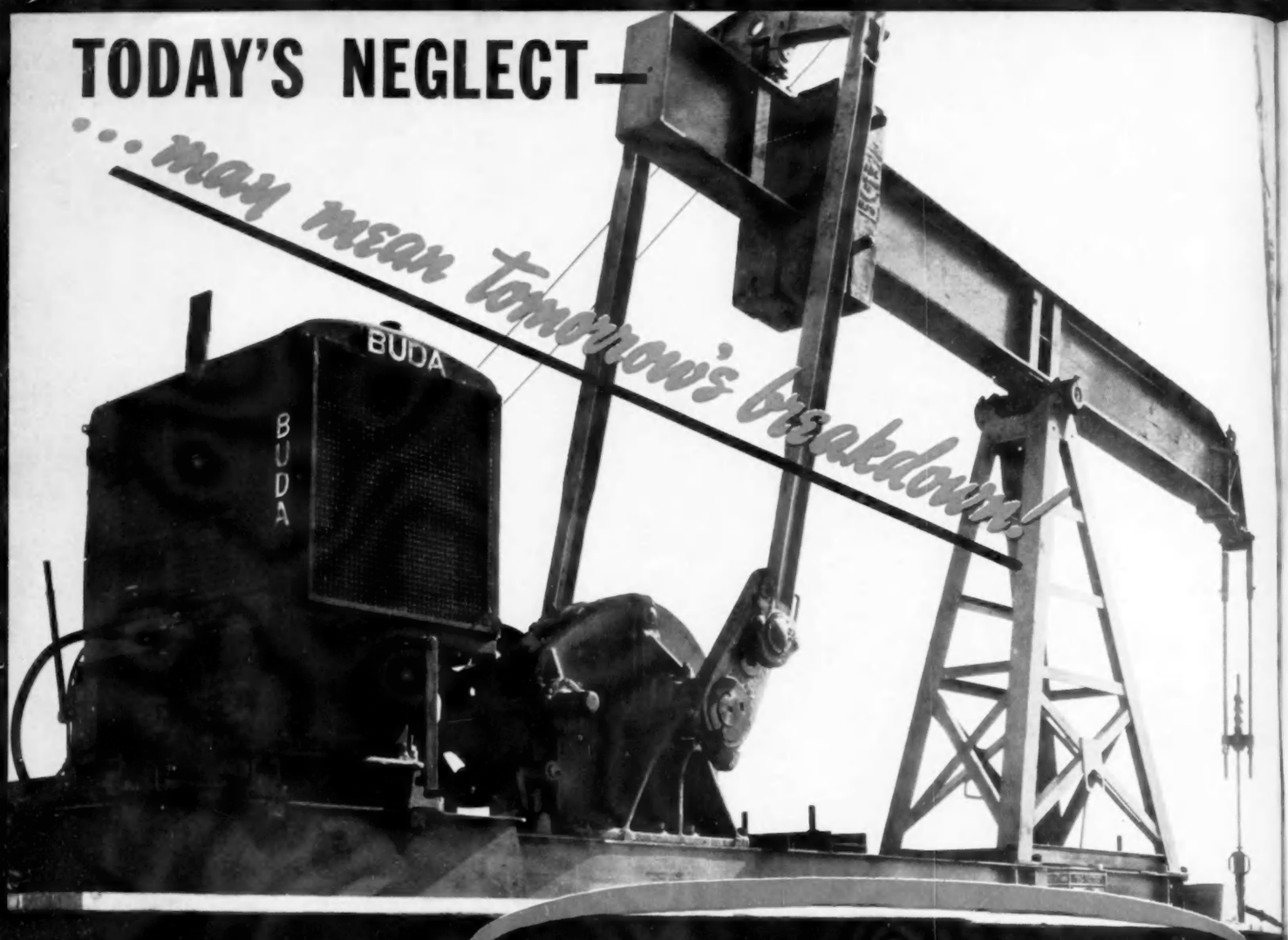

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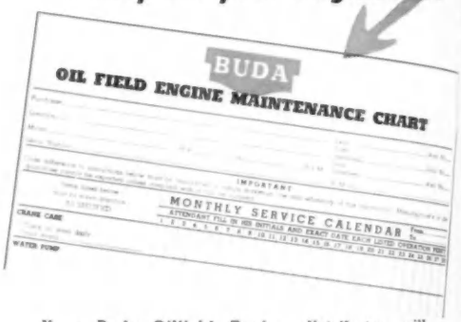
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LOOKING AHEAD
. . . with the Editor

EFFECT of well spacing on both recoveries and profits has been a highly controversial subject, with most of the more recent discussions expressing opinions favoring wide spacing of wells. Next week THE OIL WEEKLY will publish another study of this problem, which will present the other side of the question—i.e. that closer spacing of wells will increase both recoveries and profits, a conclusion drawn from case studies of several fields whose physical characteristics are similar.

THE OIL MAN'S CALENDAR

FEB. 20–24	American Institute of Mining and Metallurgical Engineers, Waldorf-Astoria, New York.
MAR. 15	American Petroleum Institute, Pacific Coast District, Division of Production, Biltmore Hotel, Los Angeles.
21–23	American Association of Petroleum Geologists, Society of Exploration Geophysicists and Society of Economic Paleontologists and Mineralogists, Baker Hotel, Dalla
22–23	Southern Gas Association, Roosevelt Hotel, New Orleans.
APRIL 10–12	National Association of Corrosion Engineers, Annual Meeting, Rice Hotel, Houston.
12–14	Natural Gasoline Association of America, Baker Hotel, Dallas.
13–14	American Petroleum Institute, Eastern District, Division of Production, Deshler-Wallick Hotel, Columbus, Ohio.
24–25	National Oil Scouts and Landmen's Association, Hotel Adolphus, Dallas.
NOV. 13–16	American Petroleum Institute, Stevens Hotel, Chicago.

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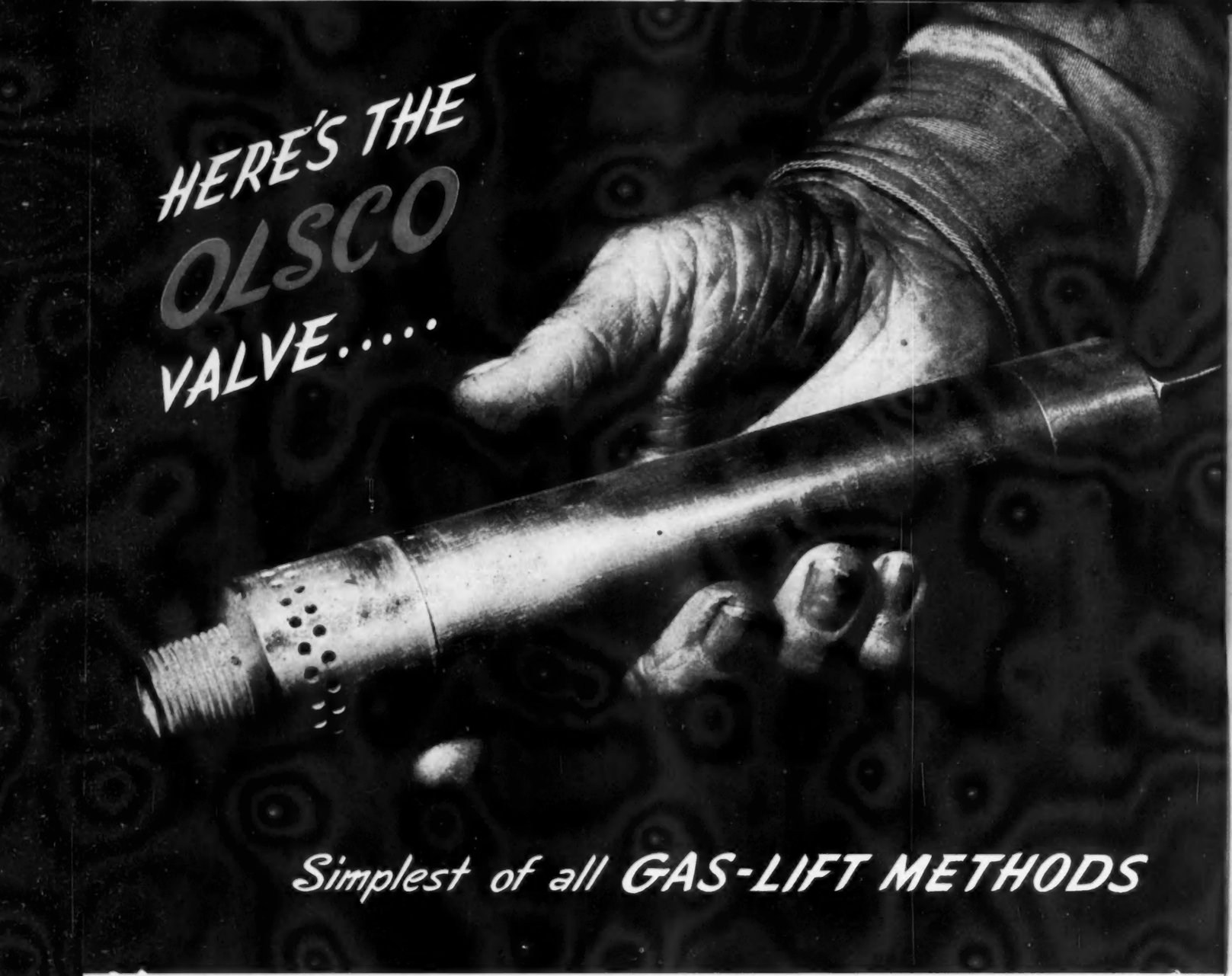

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The Changing Panorama

Who Will Dictate Foreign Oil Policy?

THE question of who will determine the foreign oil policy of the United States government has not been clarified, but it begins to appear that it will not be Harold L. Ickes. The domestic oil industry, members of Congress, and some in governmental administration circles, all have taken strong positions against Ickes' views on foreign matters.

The question of who shall direct the country's foreign oil policy apparently has been carried to President Roosevelt and, although no comment has been forthcoming as to the nature or outcome of conferences with the President, indications are that Hull may be the top man in matters relating to foreign oil policies. It will be recalled that Hull a week ago declared that the foreign oil policy of the country would be fixed by the State Department and not by Petroleum Reserves Corporation, and that in formulating any policy the State Department would consult with PAW, not PRC. In this connection, Hull has reorganized his department and an oil division is included in the new setup.

Writing of foreign oil policies by the State Department would be more welcome to the American oil industry, for Hull has said he would vigorously support the activities of American oil companies abroad.

If the State Department directs the nation's foreign oil policies, it would appear that PRC will merely be a financial lending agency and that Ickes would come into the picture only as a consulting advisor because of his position as head of PAW.

This Week's Absurdity: The idea advanced by PRC Ickes that Senator Moore should disqualify himself from serving on a committee investigating proposals of the United States government engaging in foreign oil operations and ownership because he (Moore) is "an independent oil man with a personal interest in the matter." The idea advanced appears that senators and citizens should not have a personal interest in affairs of government, and perhaps it is a wonder to one with such close Washington contact to contemplate a senator having any further interest than the perpetuation of his job and of his party. Then when Ickes adds his blast about "a former Stanolind lawyer" one must wonder if the "four freedoms" have cancelled out that old line in the amendment about "previous condition of servitude." (See page 44.)

Mexican Settlement A Partnership?

WILL the difficulties between oil companies and the Mexican government finally be solved by a partnership between El Aguila (British-owned Shell) and the Mexican government? Some who have been watching the situation say that there is more than a possibility of such a thing happening. Properties of practically all American oil interests have been expropriated by the Mexican government, a settlement for payment has been agreed upon between the American and Mexican governments, and our government has provided the funds to pay for the American properties at a figure far below that asked by the companies. It indeed would be ironical if the whole matter wound up with the United States government trying to get petroleum reserve in a part of the world where it could not be used by us in case of an emergency, while, as a result of a peculiar governmental attitude (many say emanating from the White House itself) the United States lost her interests in a neighboring country.

The situation is not as fantastic as it might seem. Aguila owned one of the most valuable properties in Mexico (Poza Rico) and its title to this property had been confirmed by the Mexican government not long before expropriation. From these Poza Rico properties of Aguila since expropriation probably one hundred million barrels of oil have been taken. The British government, unlike our government, did not send representatives to Mexico to make a deal which to many seems very unfair to the American interests, but on the other hand has steadfastly refused to be bound by any action of the American government there. When the war is over there will be an accounting between Britain and Mexico. Of that there can be little doubt. If a deal can be made to the mutual advantage of both Aguila and the Mexican government, and it results in Aguila being a partner with the Mexican government, who can say nay?

About all an American could say is that some New Deal chickens are coming home to roost.

Only 1200 Completions Abroad Are Expected

DESPITE increased foreign operations, only about 1200 wells are expected to be completed outside of the United States during 1944. This is the conclusion to be drawn from the remarks of Frank A. Watts, PAW materials director, at the February 3 meeting of PIWC.

Watts declared that about 5 percent as many wells would be completed in foreign fields as in the United States. Since PAW estimates 24,000 wells will be completed in the United States during 1944, this would mean the agency anticipates 1200 completions abroad.

Rotary rigs in operation in foreign countries would increase by the end of the year to a number equal to 10 to 15 percent of the number running in this country, Watts stated. On this basis, from 180 to 270 rotary rigs are expected to be working abroad by next December for PAW has estimated that 1800 will be operating in the United States.

Thompson Favors PAW Dissolution

ERNEST O. THOMPSON, member of the Railroad Commission of Texas, writes that he thinks it is time to abolish PAW regulation of drilling and production operations. Thompson's letter follows:

"It was with unusual interest that I read your splendid editorial entitled, 'PAW Dissolution May Be Sought'. [Page 9, February 7 issue.]

"Certainly it is time to relax and abolish all the unnecessary red tape required by PAW for a person to drill an oil well.

"The State of Texas has a splendid oil and gas conservation law and it is administered in an efficient manner.

"With the steel shortage easing up there can no longer be any good reason for a Texas operator to have to appear before or even file any papers at Houston PAW office or in Washington—he has to obey the state law rules and regulations in order to drill and produce and transport and that is all that is necessary.

"We have fulfilled every requirement for oil and more can and will be pro-

duced if the PAW red tape is now dropped as no longer needed.

"Cooperation was given wholeheartedly when it was thought to be needed. Now that it is no longer supported by a steel shortage the regulation of drilling and producing oil should be left to the sovereign states in states where there are state regulatory authorities.

"This would quickly bring about the passage of satisfactory conservation laws in states not now having them.

"The federal government should not enter a field of endeavor that is amply covered by state law.

"There is no good to come from pressing a suit of clothes twice before use.

"Your editorial is timely and wise. It should bring prompt action."

The article to which Thompson refers was not an editorial, as it did not profess to express any opinion on the matter of PAW dissolution, but merely set forth the trend of thinking among some members of the oil industry. In the adjoining column, THE OIL WEEKLY does publish an editorial on the subject, and therein expresses its own opinions on the subject.

Crude Supply Troubles

WEST TEXAS operators have been looking forward to higher production allowables during April, when new pipe lines would provide the area with increased transportation facilities. However, they may be keenly disappointed, for demand may not approach expectations.

One refinery that was expected to use West Texas crude has been delayed because of inability to get materials to complete it, and other sources that were counted upon to utilize West Texas crude have found supplies.

Unless refiners having crude supply troubles evidence more interest in West Texas sour crudes, it is possible that the new pipe lines into the area will not operate at capacity for sometime.

Mexican Decision

A DECISION by the Supreme Court of Mexico, reported elsewhere in this issue, holds that only Mexican individuals or groups of Mexican individuals, may develop Mexico's oil resources. Which makes passing strange reports recently of the Mexican government offering American oil men the right to develop certain wildcat tracts on a 50-percent-royalty basis, and it does not jibe with an appeal made by a high government official in Mexico some time ago to foreign capital to come to Mexico and help develop resources.

Red Light

By RAY L. DUDLEY, Publisher

WE SINCERELY hope that no effort will be endorsed by the oil industry to dissolve Petroleum Administration for War at this time, as was indicated in THE OIL WEEKLY (Page 9, February 7). This we say, not because we believe that all of the operations of PAW have been perfect, but because we believe that dissolution, or even endorsement of immediate dissolution of PAW at this time would be fraught with great dangers to the industry.

There is no question as to a growing feeling on the part of many that drastic improvements in the PAW set-up are necessary if the oil industry is to do its job of meeting increased demand for crude oil. There is a growing fear that efforts may be made to keep PAW in operation after the war. There is a genuine feeling on the part of some that the oil industry will do a better job of producing oil if much of PAW were eliminated.

We do not know how well founded these misgivings may be. Certainly any official or semi-official step by PAW to influence state legislation would give rise to even greater misgivings. Certainly the attitude of those connected with PAW in high official capacities will be more closely scrutinized in the future than has been the case in the past.

That is one side of the picture. On the other hand PAW has accomplished much—and one reason it has accomplished much is that the head of PAW has been willing to assemble in PAW thoroughly competent oil men. It does not take a vivid imagination to figure what would be happening to the oil industry in a government of multiple bureaus if the oil industry did not have its own governmental spokesman on the matter of materials. Of course PAW has not been perfect in getting for the industry the materials it has needed and does need, but considering everything, it has done a good job. It slipped a cog or two in not recognizing the manpower situation earlier, but it is alert to this particular matter now. The transportation problem could not have been solved to the extent it has been solved without PAW. Under the aegis of PAW the industry has been allowed and even told to do certain practical things which unreasonable laws and more unreasonable policitians forbade previously.

Suppose for a moment that PAW has been dissolved and the war is still on with its tremendous requirements for oil and transportation. How would an individual company go about getting material in a situation where organized government bureaus are all demanding materials, and other bureaus, ignorant or suspicious of the needs of a petitioner, have the power to allocate or withhold equipment?

With the war on, every other industry is geared to the bureaucratic control system which cannot be swept away by a group of protesting oil men.

Too, would it be advisable to attempt to operate the thoroughly scrambled transportation system under anything but a common head at this time? And isn't the transportation problem a real war emergency problem?

The oil business has the challenge of producing increased amounts of oil. If the monkey were put back on its shoulder at this time without the benefit of such representation as PAW affords at the capital, it might have far-reaching, almost ruinous, effects on individual enterprise from here on out.

In the foregoing, emphasis has been put on the fact that we are at war, that we have a war job to do, that some sort of contact with various governmental agencies is essential under our present method of fighting the war on the home front. But this should not be construed as suggesting, even remotely, a continuance of governmental control after the war. An effort will be made to further such control after the war, but it will fail if the oil industry does its job properly in time of war.

From a practical standpoint is it not possible to remove much of the wartime complaint on PAW administration (we have heard much less than was anticipated) and improve its service, instead of suggesting its dismissal?

California has already pointed the way.

What we would suggest is a greater decentralization in PAW, a decentralization which was indicated some time back and on which some steps have been taken. Greater power on local problems—simplification of certain drilling rules, for example—should be given the various PAW district offices, leaving to PAW in Washington the general coordination of effort as well as the important job of representing the oil industry in its contacts with other governmental agencies. It can be done, and there will not be any great objection on the part of the officials of PAW toward such an objective.

Additional authority given PAW staff in California early in 1943 results in good exploratory gains; spacing requirements adjusted on spot, field by field.

District Autonomy Getting the Job Done

THE PAW California decentralization experiment, wherein most of executive control was handed over to local authority, has worked out to the great advantage of all concerned so well that it rates the envy of other districts. (See "Red Light," page 10, this issue.)

The experiment proved a lot of advantages for "home rule," all summing up in the one all-important fact: It gets more wells drilled.

Actual delegation of authority giving District 5 a large measure of autonomy was accorded Herbert R. Gallagher, director in charge, in Supplementary Order No. 4 to PAO 11, on April 22, 1943. Ending with April 30, the first four months of drilling in California last year had averaged 81 wells a month. The average for the 8 subsequent months of 1943 was 108; and it ran up the total to the greatest figure for any single year in the California oil industry's history, with the single exception of 1924.

It is true that the incentive of moderate crude-oil price increases, effective after the first quarter, helped matters, but under the cumbersome old system of remote control it is unimaginable that any such quick step-up of drilling into operations of record magnitude could have been attained.

The decision to try out autonomy in District 5, it was explained at the time by Deputy Petroleum Administrator Ralph K. Davies, was made because it had been concluded at Washington that this particular district needed special attention and "additional authority, so that problems on the West Coast can be more intelligently, more practically and more speedily dealt with than from Washington."

Why this was more true of California than of other districts was not made clear further than the possible circumstance that California's oil fields had assumed special importance because of being nearest source of petroleum products for war zones of the Pacific. In the main, however, it would seem that the reasons cited for giving greater latitude for West Coast local control likely would be found in all oil-producing provinces, namely, the need of "additional authority, so that problems . . . can be more intelligently, more practically and more speedily dealt with than from Washington."

In California, the authority specially delegated—although necessarily short of absolute—covers remarkable scope so far as all drilling is concerned; and, best of all, it leaves little that could require reference to Washington for tedious consideration and long-deferred decisions.

The burdensome processes of filing applications and of conducting other long-distance operations with Washington were almost entirely eliminated. The new plan provided direct contact between California operators and PAW arbiters, right in Los Angeles.

The order was most effective in speeding up drilling operations first by eliminating a mass of paper work and second by relaxing spacing restrictions. Heading the new set-up was a veteran of the California oil industry with assistants familiar with every detail of the local picture. Empowered to approve or reject a well location, and qualified to judge each application on its special merits, they by-pass all red-tape and procedure with an immediate yes or no. They thus are able to do exactly what Administrator Ickes had stated as an objective of the order, "to trade steel for oil with maximum efficiency."

Aside from the delegation of authority to a local head, the order was significant in that it took cognizance of conditions peculiar to California—wide variations in sand-thicknesses, and in great difference of gravities; the necessity to treat multi-zone fields differently from those with a single horizon, availability to existing transportation, etc. Other districts appear entitled to similar handling, however, because they also have local conditions that should receive individual recognition. For instance, the Gulf Coast area has multiple producing horizons, salt domes, etc.

Spacing requirements of the old regulations immediately were superseded by adjustments, field by field, which while meeting all other requirements would raise possibilities for maximum early recovery. Previously it had been necessary to apply for exceptions where a well was located not in accordance with 40-acre spacing. Then the operator would have to mark time indefinitely and wait in uncertainty until a decision would filter down. Under the new order, in many areas, it became possible at once to start drilling on a spacing basis as low as 5 acres without obtaining exceptions. No more was necessary than application to the district office.

Moreover, denial by the director of the district office of any application was, and still is, subject to an appeal to the PAW Washington office.

One of the great savings effected by providing executive authority right in District 5 itself, is the elimination of travel between the West Coast and Washington which frequently became necessary previously. Not only was this a great waste of time and expense but

■ CONTINUED ON PAGE 24

Proposed Arabian Definite United

WHETHER or not the proposed trans-Arabian "Big-Inch" pipe-line system finally is built, together with appropriate refining facilities to handle the oil on the eastern Mediterranean coast, the projection of these plans represents an eventful development in American participation in world affairs, while at the same time promising that a definite foreign oil policy will be forthcoming.

Whatever disposition is made of the proposal, consideration of it will bring clarification of hitherto vague foreign policy as regards American participation in development of oil reserves in foreign lands.

Not yet settled, however, is the more fundamental question of whether or not the facilities will be built in the first place. Assuming that the plans will gain the approval of the numerous other interests concerned (which they may not), including the governments of Saudi Arabia, Kuwait, and Britain, as well as the directors of the several oil companies involved, then the final decision will rest with the government of the United States. And the making of that decision will constitute a clear-cut enunciation of policy on foreign oil operations, which has long been lacking.

So important is the making of this decision that the project already has had the study and tentative approval of all the American government executives and agencies concerned with oil, including the President, the War Department, the Navy Department, Joint Chiefs of Staff, Army and Navy Petroleum Board, Department of State, Petroleum Administration for War, and Petroleum Reserves Corporation. Furthermore, Senators and Congressmen turned quickly and seriously to the proposal when it was announced, and some of them have served notice that they intend to make it the business of not only the executive branch of the government but also the business of Congress, as direct representatives of the people.

Ultimately, therefore, the actual decision may be made by the people, exerting pressure through Congress, and if it is, a highly important step will have been taken in laying down the definite rules and policy which the oil industry will be expected to conform with henceforth in regard to operating abroad.

Heretofore, a primary consideration with regard to foreign development by American companies has been the intra-industry controversy over tariffs on imported oils and the competition between domestic and foreign supplies, and this question necessarily must be satisfactorily taken care of in whatever policy the government works out for the future. But fortunately, at least a practical groundwork already exists in this connection in the established tariff rates.

Apart from the question of imports and transcending it in vital importance is the first and foremost consideration involved for the nation, and the industry as well, in the matter of coming to agreement on a foreign-oil-development policy: the consideration of national safety and precaution. And it is this consideration, primarily, which is involved in the question now up for settlement, in the form of whether or not to put the government and the nation behind the Arabian petroleum facilities.

Approval of the project might logically be construed as a precedent, born of global warfare, under which the United States, as a power in world affairs, sees the necessity of adequately protecting itself, now and henceforth, with petroleum reserves in strategic places over the earth; as a precedent under which American oil companies henceforth will have not only the responsibility of developing and maintaining reserves in foreign countries but also the encouragement and continuing and unequivocal backing of their government.

In the outline of principles of the proposed Arabian agreement, concurred in by representatives of the government and the several oil companies, it was set forth that the projects were proposed "in appreciation of the critical importance of reserves of petroleum in war and in peace, and of the necessity of assuring to the military forces of the nation and to the people of the United States adequate petroleum supplies."

In view of this virtual unanimity of support of the Arabian proposal by military and government leaders, it may be concluded that the time has arrived when the government no longer can safely be indifferent to the activities of the American oil industry abroad; when there must be established a closer relationship and cooperation. This general conclusion may be drawn, regardless of what action is taken on the specific project now under consideration.

As to the Arabian proposal itself, the thorough airing which is in prospect for it doubtless will bring out important weaknesses and valid objections to it, although it remains to be shown how heavily they will weigh against supporting argument. It is to be expected, for example, that there will be a questioning of the relative safety of the proposed facilities from attack and a questioning of the necessity of the proposed big pipe lines as against the use of tankers for hauling oils around Arabia and through the Suez Canal.

As to both the economic and strategic importance of the oil reserves of the Near East, however, there can be no questioning or doubt. The region definitely is among the several richest in the world in petroleum reserves. The known reserves there are estimated at more than 16 billion barrels or nearly one third of the total world reserves of about 55 billion barrels, being almost equal to the 20 billion barrels of the United States, almost double the proved reserves of Russia, and more than double the combined reserves of all South American countries and Mexico.

Even under the plans which have been announced, only the general program for the Near East expansion has been determined, with some of the important details yet to be decided upon by the government, including the exact route and size of the proposed pipe line. The estimate that the pipe-line system will cost between 130 and 160 millions of dollars is based on the assumption that the cost will be 50 percent or more greater than that of the Big-Inch line from Texas to New York, because of construction difficulties and high expense of transporting men and equipment.

The line as envisaged would start near oil fields in Saudi Arabia at Qatar peninsula along the Persian Gulf, adjacent to which is Bahrein Island with its oil wells and refining facilities, and would be fed also by a fork line reaching northward to fields at Damman in Arabia and to fields in Kuwait. From this junction point, the line would be full-size and extend around 1000 miles westward across Arabia to the Mediterranean. With the feeder lines, of smaller diameter, the whole system would consist of about 1500 miles of pipe. For the full-size trunk line, beyond the junction, tentative plans call for 24- and 26-inch pipe, and steel mills in the United States

Pipe Line Should Result In States Foreign Oil Policy

Regardless of whether government plans to finance Near East pipe line are finally approved or not, the debate that the proposal is certain to create should bring a showdown on hitherto vague policy regarding American participation in development of foreign oil resources

By L. J. LOGAN, Associate Editor

are reported in position to start drawing tubing when necessary contracts are arranged. About 15 to 18 pumping stations would be required to provide the contemplated carrying capacity of 200,000 to 250,000 barrels per day.

The tentative agreement between government and oil company representatives as made public gave only "a point near the presently discovered oil fields of Saudi Arabia and Kuwait" as the eastern terminus of the trunk line and "a point at the eastern end of the Mediterranean Sea" as the western terminus, leaving those exact terminal points to determination by the government. However, earlier press reports out of London several times mentioned Alexandria, Egypt, as the probable end of the line, because of its favorable port facilities and strategic location, and therefore also as the site for refining facilities for processing the 250,000 barrels of crude per day to be supplied by the line.

The British papers at the same time broadly outlined the whole plan for Near East expansion as reportedly contemplated, and other details have been announced officially from Washington. (Last week's issue, pages 35-36, and this week under Washington Roundup.)

Regardless of what is done about the Arabian "Big-Inch" proposal, some important further expansion definitely will be carried out in the Near East, including immediate construction by Arabian American Oil Company (formerly named California Arabian Standard Oil Company) of a privately owned and financed refinery in Saudi Arabia, "to make petroleum war products for the United Nations" from Arabian crude oil. PAW will support the project by requesting WPB to grant "the highest obtainable priority" for necessary materials. The plant perhaps is intended as a source of oils for war in the Far East as well as for war in the European theatre.

Other expansion work in the Near East, principally refinery expansion, has been under way for some months, it has been officially revealed. The Bahrein Island refinery, jointly owned by Standard Oil Company of California and The Texas Company, which similarly own Arabian American Oil Company, is being substantially increased in capacity. It was rated at 32,500 barrels daily several years ago. Meanwhile, more refining capacity is being provided also at the refinery of the British at Abadan, Iran, at the head of the Persian Gulf, and at the refinery of Consolidated Refineries, Ltd. (Shell and Anglo Iranian interests), at Haifa, Palestine, Eastern Mediterranean port. The Haifa plant originally was completed in January, 1940, after this war started, with 40,000 barrels daily capacity, which conformed with the capacity of the southern leg of the Iraq pipe line from Kirkuk, bringing in Iraq crude oil. The British press reports indicated that present plans of the British call for increasing refinery capacity at Haifa to the extraordinary amount of 350,000 barrels per day, along with comparable stepping up of pipeline capacity from Iraq fields by building a second line paralleling the original Kirkuk - Haifa line. This presumably would have to be another line of 24 or 26 inches diameter.

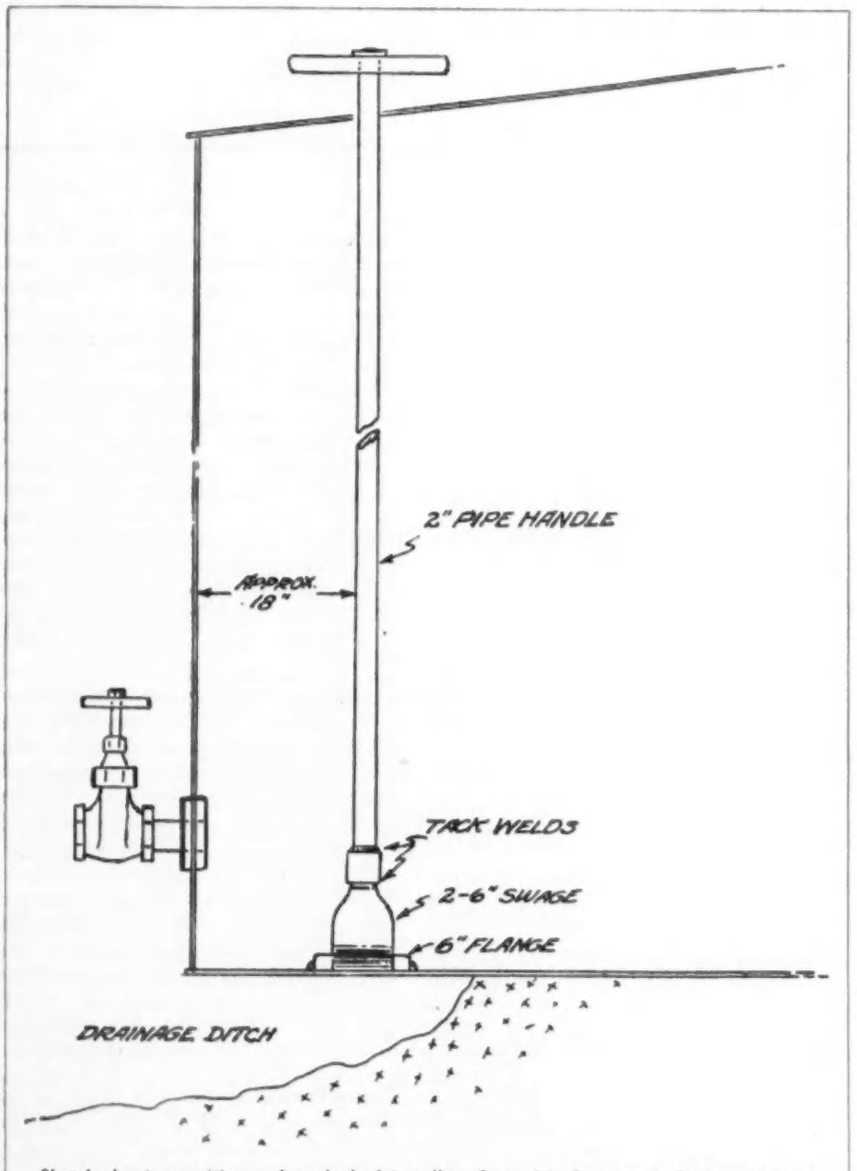
In connection with the contemplated large refining capacity at Haifa, it appears logical that the British also may have in mind eventual extension of the pipe lines at Kirkuk about 100 miles to the southeast to connect with prolific fields along the Iraq-Iran border, which currently supply only interior refineries.

Rounding out the Near East expansion currently under way or contemplated for the immediate future is that involving the Abadan, Iran, refinery and pipe line and producing facilities supplying it. Latest revealed figures on refinery capacities, now several years old, showed the Abadan plant and the Aruba, Dutch West Indies, plant of Standard Oil Company of New Jersey ranking as the world's two largest, with each having capacity only slightly short of 300,000 barrels daily. The Abadan plant is being further enlarged, according to the recent information; and in connection with that expansion, according to the British press reports, crude supply will be stepped up by building additional feeder pipe lines from the Iranian fields lying within a radius of about 200 miles, while some of the refined products turned out by the plant will be laid down at Haifa on the Mediterranean by means of a new 900-mile, 20-inch products line from the Persian Gulf to the Mediterranean, saving the long tanker hauls through the Suez Canal.

All this refining capacity which is contemplated for the Persian Gulf and Mediterranean areas is well over 1,000,000 barrels daily, and the question naturally arises as to what is planned regarding oil wells to supply the plants with so much crude. The astonishing answer is that no spectacular program of drilling is deemed necessary for several years. Evidently, the established fields of the Near East already have enormous shut-in producing capacity in the existing prolific wells. To supply the contemplated Alexandria refinery, existing wells in Saudi Arabia and Kuwait and on Bahrein Island would be supplemented by 5 new wells in the first year and 10 in the second year. In Iraq no new wells would be needed in the first year and thereafter only 5 or 10 per year. In Persia, according to estimates, it would be necessary to drill only 7 new wells per year.

Hydraulic Lift Principle Salvages Steel Mud Tanks

Ingenious application of rig pump pressures provides quick recovery of fabricated mud tanks for transfer to next derrick set-up without requiring ditching or digging. Auxiliary dump opening at base of tank permits complete draining without involved pumping

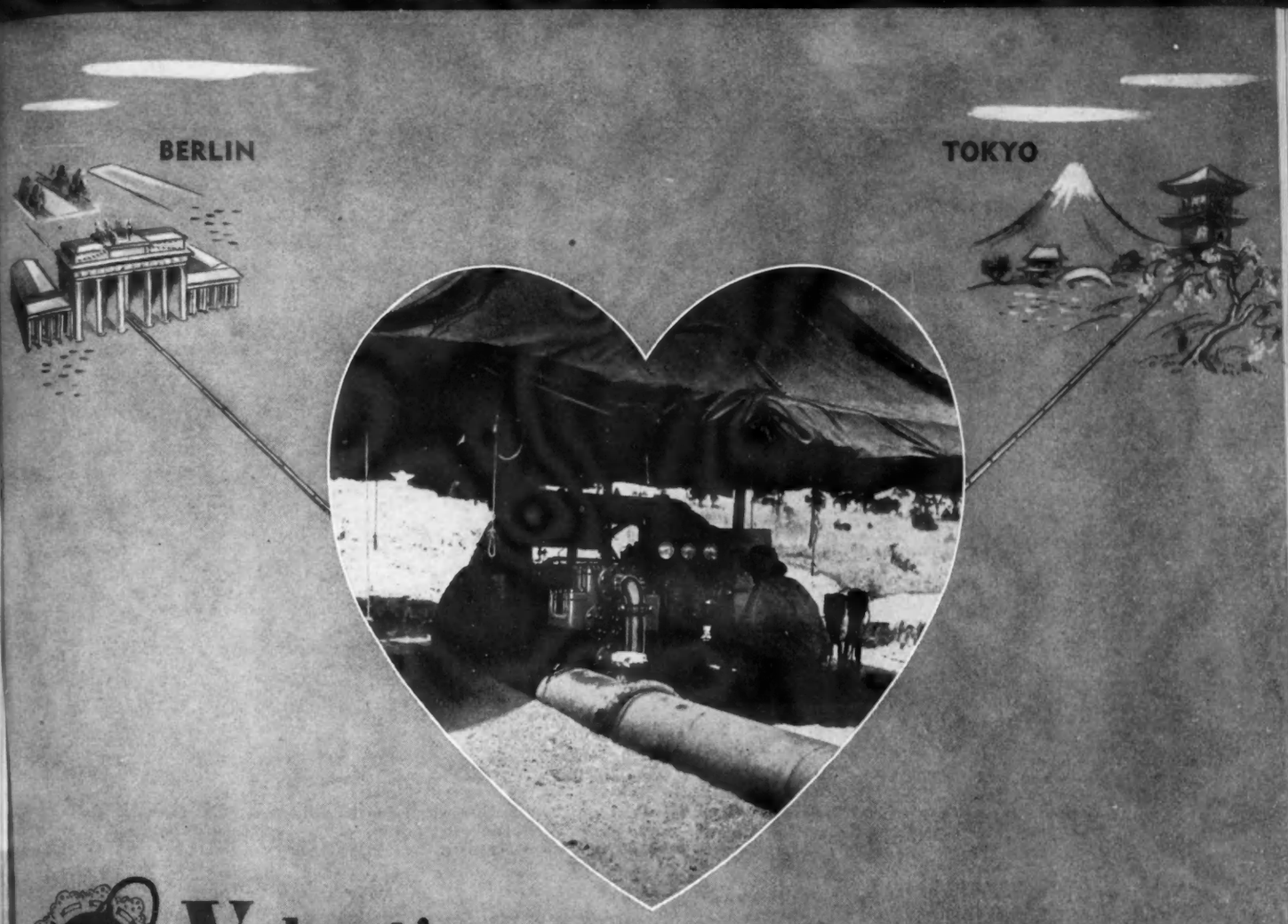


Sketch showing position and method of installing 2- to 6-inch swage in bottom of tank, together with extension handle reaching to top of tank. Ditch is dug to permit draining at time tank is moved.

UNITIZATION of drilling equipment has resulted in great savings of time and operational costs. In the process of unitization, however, additional problems often are created. Typical of these is the difficulty experienced in the moving of portable mud tanks. At least one, and often several, of the mud tanks in a full-sized rotary rig are sunk into the ground several feet or perhaps until the top is level with the surface of the ground. When these tanks are to be moved again, it often runs into considerable work to dig them out, since the mud and water which has spilled out around them during drilling operations will have thoroughly compacted the earth around the sides. Frequently it is impossible for even a crane to hoist a tank out of the ground without using shear poles, and it usually resolves into having men dig out around the tanks to facilitate their being pulled loose.

One method of doing away with this extra work is that used in a coastal oil field, and so successful has it proved that the idea is being applied to similar mud tank set-ups as fast as possible. In the center of the tank bottom a 2-inch hole was burned and a flange or heavy 2-inch collar welded over it on the inside of the tank. A length of 2-inch pipe welded to this fitting was then brought up to the level of the top of the tank, leaving the outside bottom of the tank open to the top of pipe. The use of the tank is in no way hindered by this short length of pipe, but when the tank is to be taken out, the only work necessary is to attach a mud or water line from the pumps to this exposed fitting, apply pressure, and in a matter of only a few seconds the tank is floated out of its hole. It then may be lifted directly up to the truck, since little or no cleaning of the exterior generally has to be done because of its being removed so smoothly.

Nor is this method limited to just the



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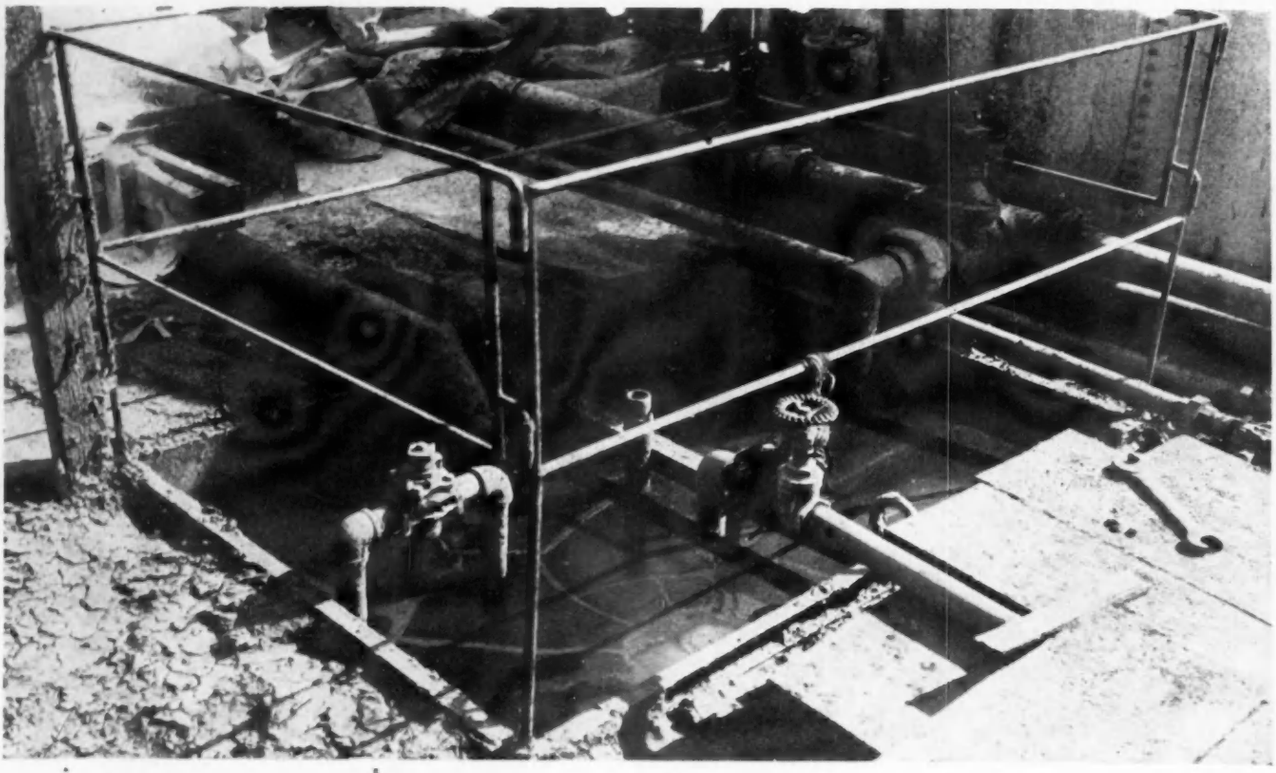

Vertical pipe showing in center of tank is open to ground below unit, and provides application of pump pressures to lift tank from ground when a transfer is desired. The line, standing above mud level, remains open throughout drilling operations, or may be capped to prevent accidental plugging.

smaller sizes of tanks. Larger tanks, of sizes ranging up to 8x8x16-foot dimensions are handled just as easily as the smaller ones. Two, or possibly three, of these fittings evenly spaced along the center line of the tank's length are utilized, and with the application of fluid pressure simultaneously to all the fittings, the tank may be floated out with a minimum of manpower or time consumed.

In certain respects, this plan is far better than the old method. One advantage is the fact the tank is lifted out evenly, causing little or no strain on the seams and preserving its rectangular shape. Since no steel tools are necessary in excavating, there is likewise no chance of the tank being accidentally punctured or otherwise injured. To facilitate lifting of the tank after it has been floated, heavy ears made of sucker-rod material were welded to the sides at the center of the tank.

In the matter of handling large tanks, the same company utilizes another time-and-labor-saving practice. Large oil and mud storage tanks that likely are to be moved at frequent intervals, often present a problem in that the bottom 6 to 12 inches cannot easily be removed after the tank has been drained down to that point. The outlet gate usually is at that level for the purpose of permitting only the cleaner fluids to be withdrawn, leaving the settlings to accumulate in the bottom of the tank. It is removing these solids and semi-solids that presents the greatest problem when a large tank is to be moved.

To facilitate moving the tank without involving considerable labor and time in cleaning it out, yet at the same time permit using the tank in the usual manner, viz., continuing to leave a back-gauge of a foot or two at the bottom for collecting settlings, a method was devised to permit draining it with an outside control operated from the top of the tank. At some convenient point in the bottom of the tank, near the outer edge, where access can be gained to it from the outside by digging a small ditch, a 6-inch round hole is cut and a flange-half then bolted or welded over it on the inside of the tank bottom. Size of hole is optional as it is determined by the type of fluid to be handled, but 6-inch has been found to be a practical diameter to use. A 6- to 2-inch swage, either fabricated or welded from a short 6-inch nipple and a 2-inch collar, is then welded to a long section of 2-inch pipe, the latter's length being determined by the height of the tank itself. If the 2-inch pipe extension handle is screwed instead of welded into a collar just above the swage, the two should be tack-welded together to prevent unscrewing the handle when the swage is later screwed out. The large end of the swage is screwed into the flange half in the bottom of the tank and the extension handle secured to the top and side of the tank near the ladder or stairway.

The tank is used in the normal manner until time for it to be drained and moved. When all fluid is drained except that below the low-gauge point, a shallow ditch is dug below the tank at that point. The swage is then unscrewed by the handle at the top. Other conditions being satisfactory, the tank will empty itself without having to remove any fluid by pumping or by men having to ladle it through a man-hole opening. Should some solids remain, a water hose played from the top of the tank usually will break up and wash them out through the drain. Only in the most difficult cases will it be necessary for a man to enter the tank to scoop out settlings, and even then it will be necessary only to break up the accumulations in order to permit sluicing them out through the opening. In any event, a tank is emptied faster, and with less labor than by the older methods.

Often a tank is lifted on a truck and transported over rough ground with some of the settling still in the tank just because it was not practical, or there was insufficient time, to remove the last few inches of fluid. Such hauling is expensive and often does damage to the tank itself. The advantages of taking the low gauge from 6 to 12 inches down to 1-inch or less each time a field tank is moved amounts to a substantial saving in costs as well as in manpower in a year's time.

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Subsidy Would Mean Gross Misuse Of Funds or Huge Bureaucracy

Administration Plan Would Result in Public's Paying Higher Tax Bill Not Necessarily Related to Individual's Use of Gasoline; Administrative Problems Inherent in the Scheme Most Complicated

By JOSEPH GORDON*

DESPITE the strong opposition which has developed in Congress to subsidies, the administration appears unwilling to discard this approach to the inflation problem. With the President himself apparently behind the subsidy program, it may be anticipated that the fight to retain subsidies will become more determined than ever. Likewise, it will be surprising if there is not concurrently an administration drive to defeat legislative price increases for crude oil of the type recently enacted by the House of Representatives.

There are those who are convinced that the great debate between the proponents of the subsidy and the proponents of the general price increase methods for handling the domestic crude-oil-shortage problem may be resolved by compromise; however, there is just as much reason to believe that the stalemate will continue to the end of the war, or the abandonment of the price control machinery, whichever comes first. At the same time, a full understanding of the subsidy issue is of tremendous importance both to the petroleum industry and to the American enterprise system of which it is such an outstanding part. For this reason, there cannot be too much discussion of the fundamental factors underlying the question of subsidies.

Through Judge Vinson's crude oil price decision of October 29, and the Office of Price Administration letters of May 1 and August 7, the administration officially sponsored subsidies as a war emergency method for stimulating the domestic discovery of new crude-oil reserves and for maintaining and expanding the domestic supply of crude oil. It is quite clear that this approach to the matter has the full support of Justice Byrnes and the President, although the Petroleum Administrator for War has continued his vigorous dissent to the subsidy technique for solving this critical raw-material shortage.

In its advocacy of subsidies for crude oil, the administration has dismissed as "the product of over-active imagination" any "suspicion by the oil industry that any effort is being made by any government agency to supplant the industry." The administration has contended that a subsidy program will cost less than a general crude-oil price increase and will prevent any further increases in the cost of living. It has contended that a subsidy program will permit the use of funds where they are most needed and where they will do the most good. It has cast aside as unworthy of comment any claim that the operation of a subsidy program for crude oil will impose technical or other administrative difficulties of an insuperable nature.

Within the limits of a relatively brief discussion, it is proposed to deal with each of these components of the administration's subsidy position.

In an effort to quiet the fears of governmental control, the proponents of subsidies have attempted to link them to the American tradition. Their argument runs:

Subsidies are as old as the nation. Did not the railroads receive land grants as an inducement to open up the country's frontiers? Have not many of our great industries grown out of their swaddling clothes under the protection of high tariffs? And have not discharged members of the armed services received pensions from the government ever since the Revolutionary war? Describe them as one will, are not all these subsidies, and therefore is there not a well defined precedent for establishing additional subsidies?

Quite A Difference

This is a seductive appeal, and one which it may be especially difficult for financially harassed members of the petroleum industry, or any industry, to resist.

There is a tremendous gulf between the principles which underlay railroad-land grants, protective tariffs and bonuses for soldiers and those which underlie the proposed subsidies for oil operators, and no amount of sophistry can bridge it. Both land grants and protective tariffs were deeply rooted, of course, in public support and were not crammed down the throats of the American people. The core of the difference rests in the fact, however, that land grants and protective tariffs were for the purpose of nurturing and fostering private enterprise, while implicit in such subsidies as have been recently suggested is a well-grounded threat of either immediate or ultimate restriction and control over private enterprise.

Pensions to ex-members of the armed services represent an expression of gratitude by the nation to those of its members who have risked their lives to protect and preserve the United States. Any attempt to relate soldiers' bonuses to the present subsidy issue is purely and simply a red herring.

Greater Increases Elsewhere

As to the administration's contention that a subsidy program would cost less than a general crude oil price increase, the cost of the general crude oil price increase recommended by the Petroleum Administration for War was estimated at around $500 million. It was estimated that 32 percent of this total cost, based upon estimated consumption of petroleum in the third quarter of 1943, would be borne by the United States armed forces and Allied Nations, the balance by other consumers. It was estimated that the recommended $0.35 per barrel increase in crude-oil prices would cost the average motorist $2.97 per year, the average operator of a truck $10.06 per year, the average farmer operating a tractor $4.96 per year, and the average householder heating with oil $11.93 a year. The administration considered this too great a cost for the consumer to pay to assure a sufficient supply of petroleum for the war program and for essen-

* Formerly chief, Economics and Supply Section, PAW, where he devoted his energies largely to the development of PAW's position on the crude-oil-price question. He is now a private consultant on petroleum economics and finance.

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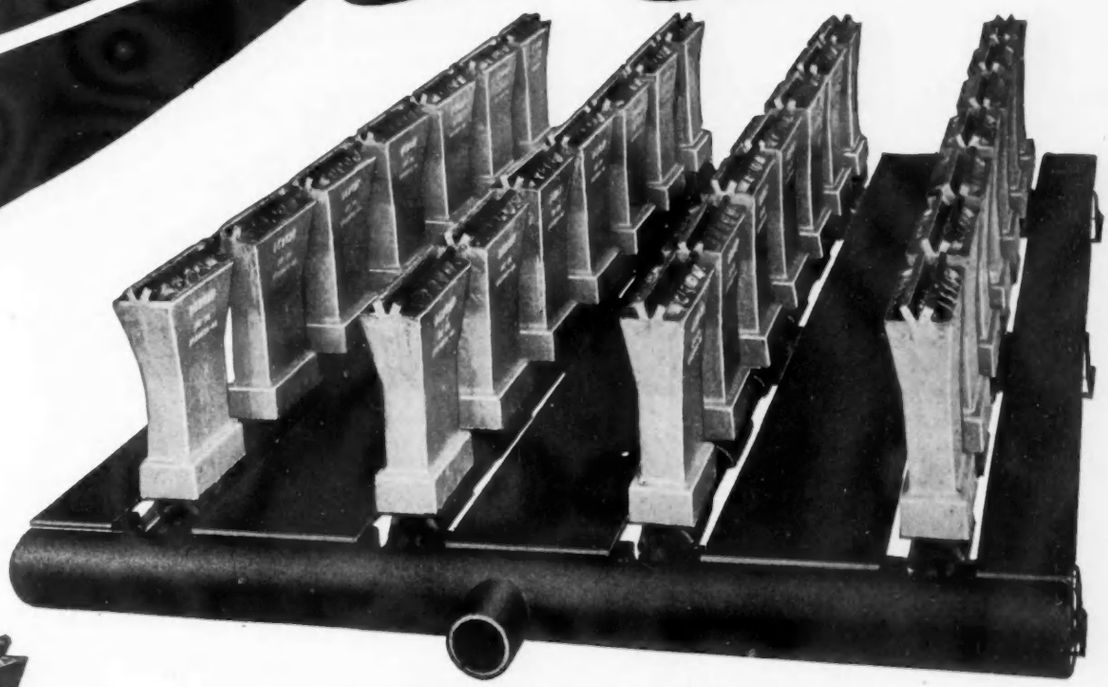

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tial civilian activities, although every housewife can testify to the enormously greater percentage increases which have taken in vegetables and other food prices, in the face of price control of these commodities.

It is the considered judgment of experienced oil men who have appraised subsidy proposals for crude oil that they would cost more and achieve less than a crude-oil price increase. Deputy Petroleum Administrator for War Davies testified to this effect before a public hearing of a subcommittee of the Committee on Interstate and Foreign Commerce immediately after Judge Vinson's price decision was handed down and the Petroleum Administrator's letter of November 4, to Judge Vinson reiterated this position.

Administrative Difficulties

The reasons why a subsidy program would cost more than the crude-oil price increase will be readily apparent from the discussion of the administrative difficulties inherent in such a program which is contained in a later portion of this article. However, in brief the administrator of a crude-oil subsidy program would be forced to choose between wasteful and possibly gross misuse of public funds or the creation of a huge federal bureaucracy in an effort to prevent it. Either way the results would be negligible and the public would have the dubious satisfaction of paying for the subsidy program through a higher tax bill, which might or might not be related to any individual taxpayer's use of gasoline.

The contention that funds can be channeled where they are most needed and where they will do the most good through a subsidy program has a hollow ring to it as far as experienced oil men are concerned. Under certain proposals that have been advanced, subsidy payments would be made to those who could make the least effective use of them, and under other subsidy proposals that have been advanced, payments would be made to those who least deserve them. This will also become more readily apparent from the discussion that follows of the many practical difficulties inherent in a subsidy program, but the general principle can be stated that public funds will never be expended as efficiently and economically as private funds.

But even assuming that crude-oil subsidies were desirable in principle, it can still be established that their practical operation would involve an impossible administrative task, and one which any fully informed and responsible government official would refuse to undertake. This is demonstrated by the unwillingness of PAW Ickes to go along with a subsidy program. An agile brain, and especially one uninhibited by any actual operating experience in the oil industry, can conceive of literally hundreds of different subsidy plans designed to provide an alternative to a general crude-oil price increase.

Irrespective of how they are stated, however, all subsidy plans which meet the requirement of Judge Vinson's decision of October 29, can be classified into four main categories, as follows:

(1) Federal financing of wildcat drilling,
(2) A federal subsidy on new crude oil reserve discoveries,
(3) A federal subsidy on high-cost crude-oil production,
(4) A subsidy to refiners to compensate for higher crude oil costs.

The administrative problems implicit in these broad categories of crude-oil subsidies apply with equal force to the many variations of subsidy plans possible under each category. The other non-administrative disadvantages apply either individually or in combination to all the possible variations of subsidy plans.

Federal Financing of Wildcat Drilling: The purpose of this type of subsidy would be to focus funds directly upon the exploratory effort. This subsidy program could vary from an outright federal grant equal to the cost of drilling a wildcat well, with no repayment required, to an advance of any part of the cost of drilling a wildcat well, with repayment required by the federal government in whole or in part.

What Is A Wildcat?

The first technical problem presented, and one that may seem to present no problem at all to the layman, is what is a wildcat well. A successful wildcat well is obviously one that taps a new pool or field, but even here it frequently requires the passage of considerable time before it can be definitely established that a new pool or field in fact has been discovered. It may develop that what at first appeared to be a new field was instead an extension of an old field while conversely what was thought to be another well in an old field had actually opened a new pool. This problem of accurate definition would be further complicated in the case of unsuccessful "wildcats" where endless discussion could be engendered by the question of whether a given dry hole was actually in unproven territory or was in what had been thought to be a proven area.

If the federal government attempted to restrict its aid to the financing of wells which were properly wildcats, it would be necessary to establish a technical staff to pass judgment upon each location. Even with the most experienced oil men, a number of arbitrary decisions would be required. This would open the door to countless pressures, particularly of a political nature, from those individuals who desired their wells to be classified as "wildcats" and therefore to receive the benefit of federal financing.

A second and related problem would be to determine whether all wildcat wells were to be financed by the federal government under the subsidy plan, or merely those wells which would not otherwise be financed. If the former course were chosen, the federal government would be financing a great number of wells which would have been drilled anyway. If the latter course were chosen, what standards could be set up to determine whether any given well would or would not have been drilled with private funds? How large a staff of cost accountants and other "experts" would be created in an effort to answer this question?

Finance All Drilling

Beyond this, since a wildcat well is by its nature difficult to define conclusively until some time after it has been drilled, how much pressure would be exerted to have the federal government finance more and more marginal "wildcat" wells and finally to finance the drilling of all wells?

There is also the problem presented by those individuals who would attempt to drill for dry-hole money rather than for oil. It is quite possible that through the inflation of costs, selling of spreads, or through dry-hole contributions from non-governmental sources, a promoter could pocket a nice profit on each dry hole drilled with the assistance of federal funds. Any effort to prevent such an abuse of public funds would call into play an army of investigators and auditors, who, while necessary to protect the federal treasury from the promoter, would merely harass and impede the operations of the legitimate operator.

Another practical operating problem would be presented by the necessity of making decisions during the drilling of a wildcat well. Suppose the federal government had put up $50,000 to finance the drilling of a 6000-foot wildcat well. When the hole had reached 6000 feet there was only a poor showing of oil, or no showing, but there was good reason to believe that a producing oil well could be brought in at 6800 feet. Would the government assist in financing the well to 6800 feet, or would it require it to be abandoned at 6000 feet? If the former action were approved, would this decision be made in the field or in Washington, who would make it, and under what standards? Who would bear the cost of maintaining the drilling crew, while a decision was pending? There are numerous other operating problems arising in the course of drill-

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Length	7′ 6″	7′ 6″	7′ 6″	7′ 6″
Width—4 Sheave	28″	30″	49″	.....
5 Sheave	31″	34¼″	49″	.....
6 Sheave	.....	38½″	49″	46¾″
Center Pins—Hardened and Ground	Single 5¾″ dia.	Single 7″ dia.	Double 8″ dia.	Single 8″ dia.
Sheaves	30″ CHNI Steel	36″ CHNI Steel	36″ MN Steel	46″ MN Steel
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Boxes	Cast Steel	Cast Steel	Cast Steel	Cast Steel
Beams	2 70 lb I Beams	2 70 lb I Beams	4 58 lb Channel	2 70 lb I Beams
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ing which would likewise come up for more or less arbitrary decision by federal authorities.

It is apparent that any effort to finance wildcat drilling would either (1) create a large federal bureaucracy which would harass and restrict the operations of legitimate operators in an effort to prevent the unscrupulous operators from raiding the federal treasury, or would (2) permit a wasteful expenditure of public funds, if the proper safeguards were not established. It is likewise apparent that the technical problems involved in determining in advance whether a given well is properly a wildcat well would lead to endless controversy and would create steadily mounting pressures to broaden the classification of those wells being financed by the federal government.

Bonuses For Discovery

Federal Bonuses on New Crude Oil Reserve Discoveries: In the application of this type of subsidy, a variety of specific plans can be visualized ranging from an outright federal grant of say $50,000, or some other amount, to the discoverer of a new pool or field to a premium payment of $0.25, or some other amount, for each barrel of production from a new pool or field. The administrative and other problems presented by this type of subsidy are similar to those which would be encountered in any attempt by the federal government to finance the drilling of wildcat wells.

There would arise immediately the problem of whether a given pool or field could properly be identified as a new discovery. As in the case of the financing of wildcat drilling, the question would lead to endless debate, and would open the door to pressures designed to broaden the scope of the definition of a new pool or field.

Suppose, for example, that a field is opened which is thought to be a new discovery and the federal government pays a substantial bonus on it. Several years later, it is conclusively established that this field was merely an extension of an old field found many years previously. Would the government attempt to obtain a return of the bonus, and what would be the position of the operator who has long since spent the money involved? Or take the opposite case. A producing well is brought in in an area which is thought to be an extension of a proven field. The passage of time, and additional drilling, establishes that a new pool had been opened which was not connected with the old field. Would the operator then be entitled to claim a reward from the government, and what would be his position if by then the subsidy plan had been abandoned?

Likewise, the question would arise of whether every new discovery would receive the bonus, or whether only those discoveries would receive it, which would not have been made without the benefit of the subsidy. If the former course were followed, the federal government would be paying a reward on fields and new oil which would have been discovered anyway. The large oil operator must undertake a certain amount of exploratory work to stay in business anyway and he would be receiving a financial windfall on his discoveries. If the latter course were followed, the impossible administrative task would be created of attempting to determine which discoveries would not have been made without the aid of a subsidy. In either event, the small operator in straightened financial circumstances would not be in any better position to conduct an exploration program under this plan, since he would not receive in advance the money needed to undertake such activities.

Too Much Machinery

The payment of a premium upon each barrel of production from a so-called new field or pool would have associated with it the special disadvantage of any plan that pays different prices for the same quality of crude oil. It would be necessary to establish machinery to make certain that previously discovered oil not entitled to the federal premium was kept separate from newly found oil. While the great majority of oil operators would guard the public interest, the staff necessary to enjoin the unscrupulous minority of operators would be all out of proportion to the number involved, and its activities would disturb and delay legitimate operations.

A Federal Bonus or Premium for Higher Cost Production: In an effort to assist the small stripper-well operator, various proposals have been advanced which would have the effect of paying a premium price for high-cost production. Those proposals vary from a bonus related to the number of stripper wells in operation to one related to production from each stripper well. The purpose of these plans is to prevent stripper wells from being abandoned and, if possible, to augment their production.

The problem of correct identification of a stripper well is even more difficult than that of correct identification of a wildcat well, or of a new pool or field. A stripper well may be defined as one that is just returning its cost of operation, although in many instances it may be returning much less than its cost of operation. Within the boundaries of this general definition, there is room for endless debate. In one part of the country, a 20-barrel well may be a stripper well and in another part of the country, a stripper well may be a 2-barrel well. There is involved in the definition the price of the oil, the engineering conditions under which the well operates, and the accounting basis upon which the cost of production is calculated. For each well, there are variables involved in all these factors, while there is a great difference among operators as to the manner in which costs are computed.

Difficulties Ahead

It would require a staff of geologists, petroleum engineers, cost accountants, and analysts of overwhelming size just to attempt to segregate the stripper wells from the non-stripper wells, and there would never be complete satisfaction among operators with the results of such segregation. Political pressures would be set in motion designed to have more and more wells classified as stripper wells, and therefore subject to the federal bonus or premium.

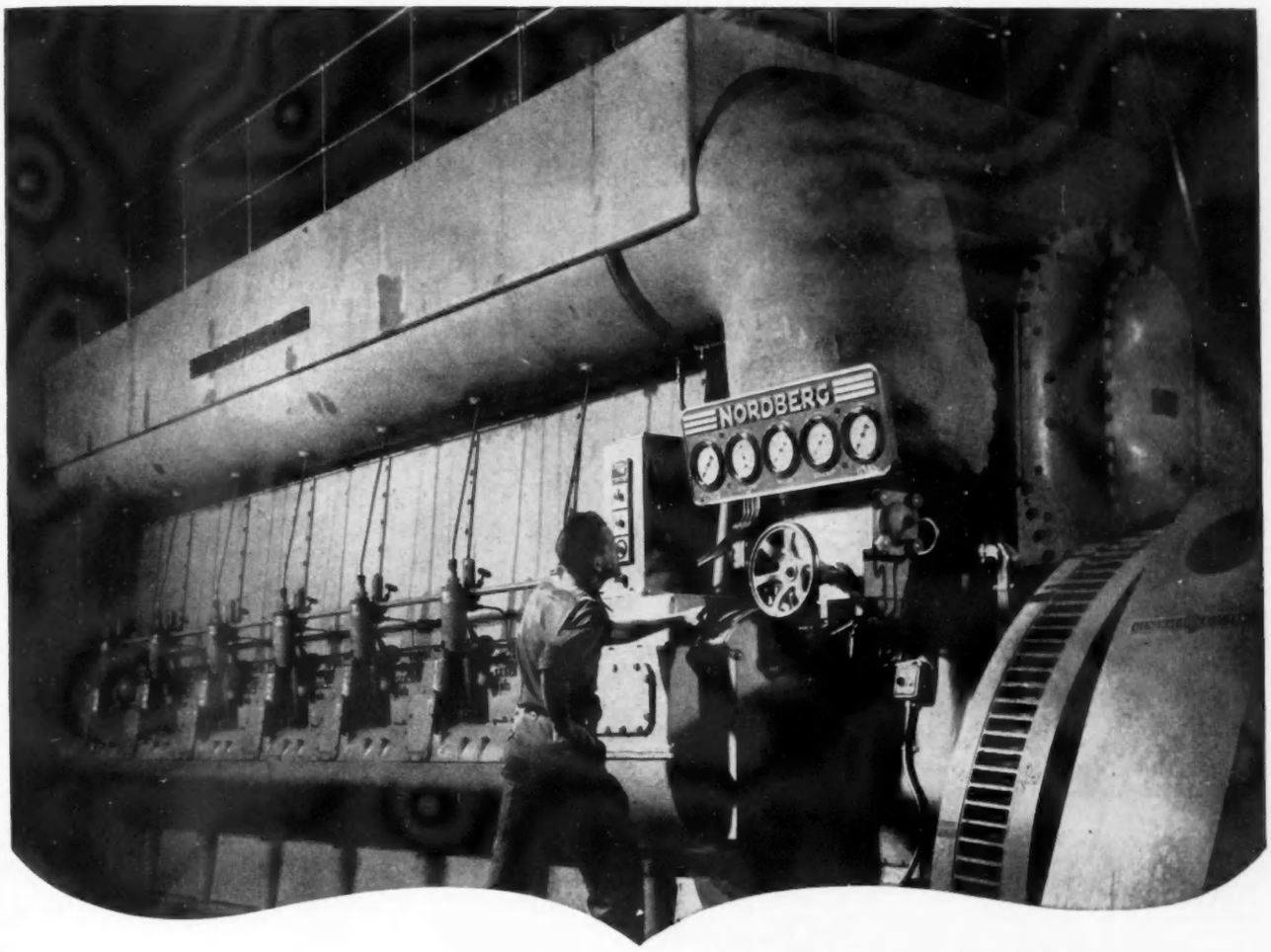
Moreover, the great majority of stripper wells are in the hands of large operators and would be maintained in production without the benefit of a federal bonus or premium. A bonus or premium upon all stripper wells would represent a waste of public funds. However, any effort to discriminate in the application of the bonus or premium to those stripper-well operators who need it would entail an impossible job of attempting to separate the sheep from the goats. It would engender bitterness within the industry and grievances against the government.

Another insuperable administrative

Reservoir Efficiency and Well Spacing

CONSIDERABLE interest has been aroused in a series of articles completed in this issue (page 28) relating to reservoir efficiency and well spacing. *The Oil Weekly* will be glad to receive and consider for publication further discussion on the subject.

The series, started January 10 and presented in consecutive issues, reprints a report of the reservoir development and operation committee of Standard Oil Company (New Jersey) affiliated companies and of Humble Oil & Refining Company. The companies have had printed for distribution a limited quantity of the booklets and those interested may request them direct.



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task would be involved in attempting to keep production from stripper wells separate from production from flush wells and from settled producers. In many fields, these three types of wells are producing in close proximity to each other and are connected with the same gathering systems and lease tanks. If a premium were paid upon each barrel of production from a stripper well, there would certainly be a powerful temptation placed before the minority of unscrupulous operators to commingle production from non-stripper wells with production from stripper wells and claim the premium upon the entire quantity. As in other efforts to protect the public interest, a large army of federal investigators would be required.

Reward Inefficiency

A bonus or premium upon stripper-well production would in many instances reward inefficiency and discriminate against efficiency. The operator who had expended money to keep his wells in good operating condition and to prevent them from becoming stripper wells would not receive the benefit of the federal bonus or premium. The operator who had overproduced his wells and allowed them to fall into poor condition and thereby become stripper wells would receive the benefit of the subsidy. The normal functioning of the profit system rewards efficiency and punishes inefficiency; this subsidy plan would set in motion a powerful force in the opposite direction.

A Federal Bonus or Premium to Refiners to Compensate for Higher Raw Material Costs: The suggestion has been advanced that producers be given a generally higher price for crude oil and that refiners who cannot absorb this higher raw material cost be subsidized. Presumably, the purpose of this suggestion is to prevent increased crude-oil prices from being reflected in the cost of living in conformity with the President's Hold-the-Line order.

Plausible as this idea may appear on the surface, it is beset with pitfalls and impossible administrative problems. Refineries all have individual operating characteristics. Refiners using identical crude oils will produce different yields of the same products, and even different products. The job of determining which refiner could absorb a general crude-oil price increase and which one could not would be an impossible one. Refinery-cost accounting is as varied and complicated as is the refinery operation itself. There would be endless dispute between refiners and the federal government as to whether subsidies should, or should not be paid. In the absence of a clear advance determination, refiners would be reluctant to pay the higher crude-oil prices and would probably be justified in not doing so.

Moreover, as in the case of the direct subsidies on crude oil, inefficiency would be rewarded at the expense of efficiency. Refiners who exerted their best effort to streamline their operations and produce the maximum volume at the lowest per-unit cost would be discriminated against in favor of those who allowed high-cost operations to continue or to develop.

Conclusions

It is apparent from this discussion of possible subsidy program that they all possess certain disadvantages and weaknesses, as follows:

(1) Subsidies encourage waste and misuse of public funds, or in an effort to protect the public interest,

(2) Require the creation of a huge federal bureaucracy, expensive to maintain, which in attempting to cope with impossible administrative problems

(3) Would investigate, regulate, and otherwise harass and control oil operators, while

(4) Promoting inefficiency at the expense of efficiency, and result in

(5) Inadequate returns in the way of additional crude oil supply with a steadily

(6) Increasing burden upon the taxpayer.

Opposed to this sorry outlook, there may be reiterated the following undeniable advantages of a general price increase as a means of expanding crude oil supply: (1) payment by the consumer in almost insignificant individual amounts directly related to his consumption of petroleum products, (2) no administrative problem either for the industry or the federal government and automatic, instantaneous execution of the increase without the addition of any staff, (3) a direct stimulation to and release of private energy and funds in line with the best tradition of the private enterprise system, (4) the assurance of an additional petroleum supply, and last but not least, (5) no problem of transition in the post-war period, which would certainly be the case if a complicated structure of subsidies were erected.

It may be that no general increase in crude-oil prices will be forthcoming until the end of the war, although local field adjustments are still possible. However, the manifest basic disadvantages of the subsidy approach suggest that, if the industry wishes to maintain the private enterprise characteristics which have made it great, the lack of a general advance in crude-oil prices, if that should prove necessary, may be the lesser of the two evils.

PAW Autonomy In California

■ CONTINUED FROM PAGE 11

it also acted as a deterrent to projected drilling simply because it made the whole thing too difficult.

District 5 PAW staff is headed by a top-drawer oil executive with intimate knowledge of California oil production, Herbert R. Gallagher, and the office is staffed with experienced men who have spent the best part of a lifetime in the industry on the West Coast. While this has been an important factor in the successful application of "home rule" in California, the existence of a qualified staff probably had influence on the decision to give the district such wide power. It might be pointed out in this connection that other PAW district offices are not without their experienced men.

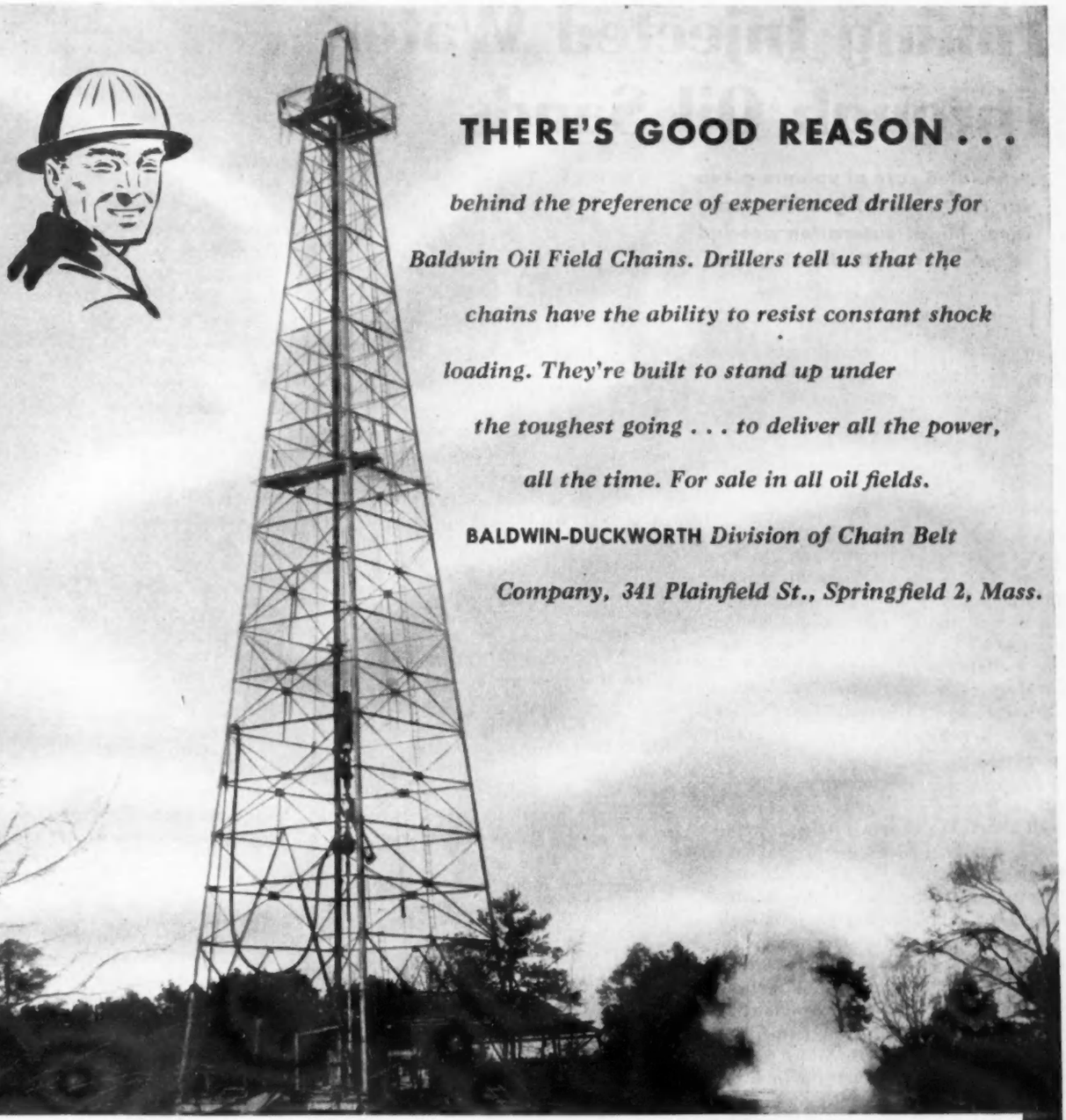
Again examining statistics for the first year of autonomous direction of the industry in California shows that approximately 700 applications for exceptions were approved by PAW from the date of the delegation of authority to January 1, 1944. All drilling authorized by PAW is on a basis as uniform as possible so as to minimize steel expenditure, provide proper drainage for each pool and be fair to each operator so that he participates in proportion to his interest.

Setting forth the main considerations that govern in exceptions, one District 5 official recently summed up the principles accepted as follows:

Highlights for 1944

"Any proposals for drilling not in line with the spacing provisions of Supplementary Order No. 4 to Petroleum Administrative Order No. 11, should be on drilling units of such size as would be justified for all other wells in the same pool. Also, such drilling should provide the greatest returns possible in oil for the amount of steel expended; since steel remains critically scarce. In order to be desirable, one barrel of oil a day should be made available for each ton of steel expended. The District Office has been empowered to grant exceptions to the SO-4 order on reduced spacing standards where justified by merit. Inability to conform with the standards of the Order should not, therefore, stand in the way of meritorious drilling."

Beginning its second year under this new form of flexible administration, the California industry has set its sights on 1700 new wells for 1944 with an aggregate footage of approximately 7,000,000 feet. This is far ahead of the high mark set for 1943.



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Timing Injected Water Through Oil Sands

Scheduled rate of volume given for best results; gradual input after initial saturation needed to prevent well channeling.

HOW long will a flood oil wall hold? Can the oil be held ahead of the water drive so as to produce all the oil obtainable before the water starts breaking through, and how far back in the sand away from the producers is such a water break liable to occur if and when it does? The position and time of such a break through of water depends somewhat on the applied hydraulic pressure and timing of water through the sand based on all known facts of gathered information available preceding the inception of initial water input. Laboratory analysis in detail can serve as a controlling factor in determining the most efficient rate of water input, but certain things have to be found out by trial and error even after the applied analyses.

For example, the wrong way to start off an input well would be to give the well all the water it will take at a pressure slightly under the critical overburden allowance (based on 2.6 times a water column equal to the depth of the well) and it is a proven fact that water will encroach to some nearby producer or producers with very little or no increase in production. And the water will be present in a large volume. Discontinue such water input immediately by shutting in the well. Allow to stand for 30 days. Then start the input off with 10 or 15 barrels per day for 30 days, allowing the surrounding sand to become water wet. Then gradually increase the input to a normal rate and it is not likely to retrace the first hydraulic channel.

Therefore, regardless of the decided rate of input, it is always good practice to first feed in the water at no more than 10 or 15 barrels per day per well until it is positive that at least a small area near the well is saturated and water wet. It is also a good policy to make gradual increases in volume input after the initial stage to assure against any positive quick channeling through the sand, as it is certain no operator wants his wells to react to channeling to any degree.

These facts of channeling have been found out from practical application, and to the detriment of such leases being flooded.

Best Flooding Results

Experience in water flooding has shown that possibly the best and most effective results have been obtained with a scheduled rate of volume varying from 2 to 5 barrels per foot of vertical oil sand at the input well. It is highly possible that the best returns would be from considering only the effective floodable sand at the input well as found from laboratory analysis. This has been used in field practice for short method of calculation to be approximately 2 barrels of water injection per foot of oil sand overall at the well. This is an average volume figure and a rate at which it is practical to start injection, which later may be modified by various local factors surrounding each input well. Frequent checks for water production at the producers is necessary. Any excess water production at a producer needs immediate attention. Either the producer or input well must be controlled. If the tubing or pipe in the producers is cemented in the top of the oil sand it is preferable to control the producer if such input has been normal. But if channeling has occurred as would be evidenced by excess rate of input without increased pressure at a nearby key well, both producer and input possibly should be controlled. At the producer this is done by holding a back pressure on the well head, and reducing excess volume of the nearest input well or wells.

In a uniform sand it is desirable to maintain uniform volume and pressure as far as possible throughout the flood. Few sands are found sufficiently uniform to carry out such practice. Possibly the best results have been obtained by sacrificing uniform pressure in favor of uniform volume input as far as possible.

Two Forces At Work

It is well to remember two particular forces at work in the sand to rejuvenate production: 1. Hydraulic and washing; 2. Surface and interfacial tension break down of the oil. Hydraulic is the force applied with the pump and must be at a pressure so as not to exceed a normal input rate, and safely within the critical overburden. Surface and interfacial tension of the oil is the resistance offered at dormancy. These forces require time in which to work effectively through the sand, and are not effective with rapid rates of water input. Under such condition the interfacial tension of the oil will not be sufficiently broken down to allow flushing from the sand and as the water increases, the permeability to water increases and permeability to oil decreases. At the ideal velocity both kinds of forces are effective.

Successful recovery from an oil sand is also commensurate with water-oil and oil-water ratios[1]. Range of saturation where appreciable amounts of oil, gas and water can flow are found to be approximately: 40 to 60 percent water; 25 to 45 percent oil, and 15 to 30 percent gas. Considerable recovery can be expected from ranges between: (1) 40 percent water and 30 percent oil. (2) 55 percent water and 45 percent oil. A sand may contain as much as 30 percent water or more and produce none at the well. Free water content within these ranges slightly higher than the oil content is considered a very favorable sign of oil recovery.

Conclusions

It is a proven fact that water-flooding operations must be done at a minimum of expense to be a successfully profitable undertaking. The following eight points are pertinent to avoid:

1. Unnecessary installations or frequent unnecessary changes.
2. Failure to make necessary changes in installations and maintenance to insure efficient operation.
3. Research and engineering carried beyond absolute necessity.
4. Allowing maintenance and overhead costs to become higher than necessary.
5. Failure to maintain close supervision over individual wells and give necessary attention promptly when needed.
6. Lack of input water checkup for stabilization and treatment.
7. Failure to maintain a constant steady pressure and volume input at all times.
8. Lack of personnel cooperation.

Producers equipped to flow rather than pump will help to maintain more even reservoir pressure. Also flowing wells will greatly reduce the amount of material and maintenance costs over the pumping method. Ultimate recovery will be equal or greater than from pumping the wells.

Spacing to pattern or spacings irregularly laid out due to using old producers preceding the water drive have proven to be reliably effective, the latter possibly not as efficient as patterned new drilling of all wells.

[1] "Role of Connate Water in Secondary Recovery of Oil," by Parke A. Dickey and Robert B. Bossler, before annual meeting of American Institute of Mining and Metallurgical Engineers, New York City, February, 1943.

"Influence of Fluid Saturation on Secondary Recovery of Oil," by Parke A. Dickey, before annual meeting of American Petroleum Institute, Chicago, November, 1943.

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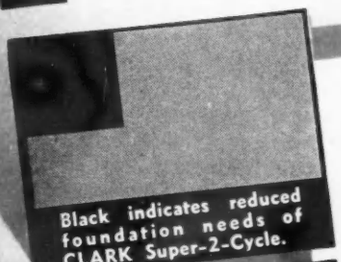

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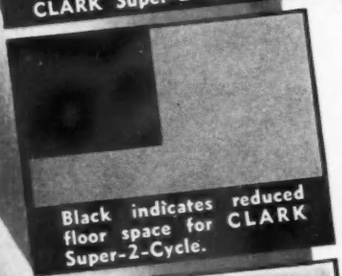

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Petroleum Reservoir Efficiency And Well Spacing

PARTS III and IV

Sixth and final installment printed in consecutive issues of THE OIL WEEKLY of a report of Reservoir Development and Operation Committee of Standard Oil Company (New Jersey) Affiliated Companies and of Humble Oil & Refining Company

PART III
Well Spacing

WELL spacing and its possible effect on the ultimate oil recovery from a reservoir has been the source of considerable disagreement since the early days of the petroleum industry. A number of theories and data from many old fields developed under competitive conditions provided the bases for schools of thought which believed that well spacing in itself had an important direct physical bearing on the mechanics of well drainage and ultimate oil recovery. It was the purpose of the committees' studies on this subject to attempt to establish the true relationship between well spacing, or number of wells, and ultimate oil recovery from a reservoir as a whole.

The committees found that well spacing of itself has little, if any, physical effect on the mechanics of well drainage or possible yields in normal continuous reservoirs, provided only that the rate of flow from the reservoir as a whole is restricted within efficient limits. As will be brought out in the ensuing discussion, however, total number of wells may have an important bearing on the time required for depletion. Further, proper well location and operation are highly important.

This finding is notable in view of the previous and still currently existing industry disagreement on well spacing. It will be appreciated that this conclusion reduces the well spacing problem largely to one of economics, in that sufficient wells must be provided, both as regards spacing and location, so as to (1) permit efficient operation of the reservoir under the principles outlined in the preceding sections, (2) insure depletion within reasonable time limits, and (3) meet various other economic considerations.

Fundamentals of Well Spacing

(a) GENERAL: The topic of well drainage or "drainage radius" is essentially a subdivision of the broad field of fluid flow. The well is simply the outlet for the oil and gas expelled from sand by various recovery mechanisms.

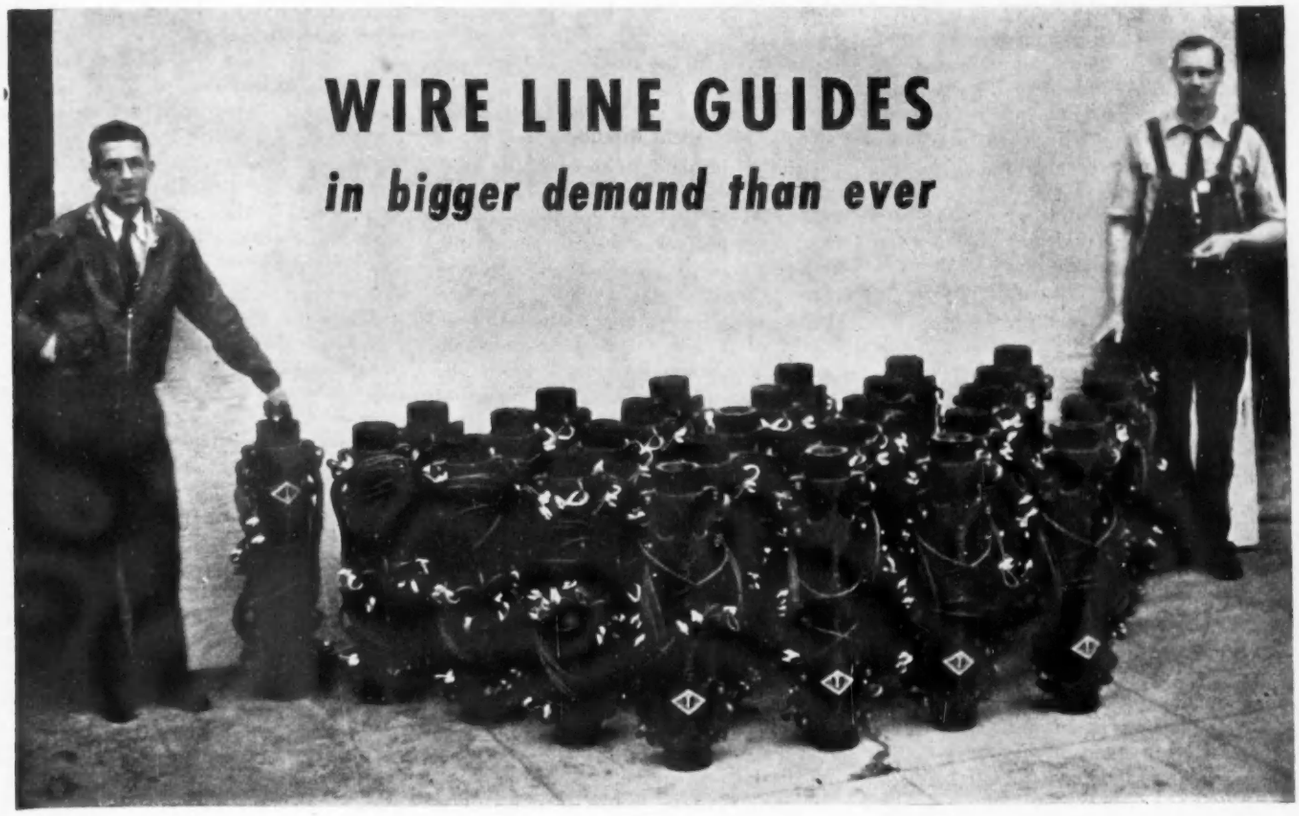
The basic theoretical or physical principles agreed to by the committees may be visualized by considering that, since oil reservoirs contain oil and dissolved gas under pressure, the tapping of a reservoir with a well and the withdrawal of oil and gas creates a local low pressure point, permitting expansion of the compressed fluids which flow to the well due to the pressure differential set up between the well bore and the main body of the reservoir. As production proceeds, and assuming dissolved gas drive with no aid from gas cap or water drive, the pressure in and near the well declines further, and the pressure radius, or extent of the differential created, gradually extends farther and farther away from the well bore with corresponding flow of oil and gas from progressively more distant points. The flow follows the course dictated by the saturation-permeability relationship already discussed. Both research and field studies indicate that in a continuous sand body this gradual extension of pressure radius is limited only by the boundary of the sand body. Time is the major factor determining the distance to which a well bore may extend its radius or influence. In theory, the gradual extension of drainage radius with time continues until the pressure becomes uniformly low throughout the sand body and approaches zero if the process is continued for infinite time, assuming that no extraneous displacement medium serves to sustain pressure.

As a corollary of this theory, consideration of the mechanics of the saturation-permeability phenomenon indicates that at any instant in the depletion period, the variation of oil saturation with distance from a well is related to the pressure gradient. Thus, oil saturation will be lowest near the well and gradually increase with distance to the current outer limit of the expanding pressure radius, where the original conditions will still obtain. As pressure decline continues, the oil saturation gradient follows a related course until, at full depletion of pressure, the final oil saturation is substantially uniform throughout the sand. Throughout this cycle, the rate of oil production declines and approaches zero.

(b) DISSOLVED GAS DRIVE: Since wider well spacing requires more time for the full cycle of pressure and saturation change, it will be seen that, at any chosen elapsed time short of full depletion, a close spacing may have a higher cumulative oil yield than a wide spacing, and further, that at any given cumulative yield, the total field rate of production may be higher for close spacing than for wide, assuming equal rates per well. Thus it may be said that in dissolved gas drive, while spacing will have no influence on possible ultimate yield, it could have a bearing on actual cumulative or economic yield at a particular limit of time or minimum rate of production. The difference would be of little importance, however, within the range of spacings and depletion time ordinarily employed in practice.

(c) GAS CAP DRIVE AND WATER DRIVE: Under the gas cap drive and water drive mechanisms, the course of pressure and saturation change described before will be greatly modified. The influx of the extraneous fluids sustains pressure and drives oil to the producing wells, thus maintaining relatively high oil saturation in the sand ahead of the displacing medium, and modifies the need for the indefinite extension of a well's drainage radius and the requirement of infinite time for depletion of the outermost reaches of the sand. In gas cap drive and in water drive there should be little, if any, necessary relationship between spacing, of itself, and economic ultimate yield, the principles of proper control of such features as fluid movement and avoidance of channeling or by-passing being the factors governing the number of wells required for efficient handling of the reservoir.

(d) WELL LOCATION: While the studies tended to minimize well spacing alone as an important factor in oil recovery, it was agreed that well location, as distinguished from distance between wells, is important in insuring proper drainage and control of fluid



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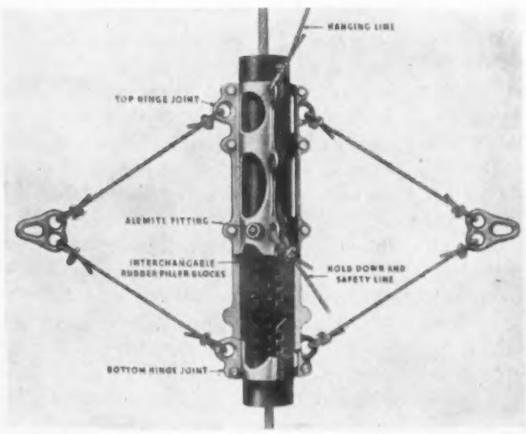

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movement within the sand. Two broad phases of this matter may be evaluated. These are, first, the distribution of wells to fulfill the requirements for regular and even water and gas movements which were emphasized in preceding discussions as prerequisites of oil recovery efficiency in the water or gas drive mechanisms, and second, the provision of wells to drain fault blocks or large lenses which may break up a main reservoir into separate units.

Only in the case of the comparatively rare purely dissolved gas drive may well location and withdrawal rates be regarded as relatively unimportant in affecting recovery efficiency, this exception stemming from the fact that the entire dissolved gas drive mechanism has inherent oil recovery characteristics which are independent of operating practices. In the other two major recovery mechanisms, which cover by far the greater number of commercially developed fields, well control and well location are highly important. It is through the wells that the necessary even advance of gas and water displacement media may be brought about, and conversely, in the absence of careful well location and control, the movement of the displacing fluid will be irregular and this will reduce ultimate recovery.

It may be seen, as a broad corollary of the relative unimportance of distance between wells, that a regular spacing pattern is not really essential since various portions of a reservoir may require different spacing patterns or number of wells and different arrangement of wells, the requirements varying with the characteristics of the particular sections. For example, if gas cap displacement is utilized in a certain field, it may be preferable to drill most of the wells in the down flank positions to which the oil will be driven in the displacement process, and drill fewer wells in the up-structure portions of the reservoir which will be taken over by the free gas. Similarly, it may be desirable to space wells more closely along the strike of such a structure then up or down dip, since the closer spacing along the strike would control gas and oil movement more precisely. The closer spacing would not be required in the up and down dip direction because of the tendency of the oil to be driven down structure as the gas expands. In the case of a water drive field, the majority of the producing wells should be located away from the down-structure portions of the reservoir which will be taken over at an early date by water; this would mean placing most of the wells in up-dip locations with fewer wells near the original oil-water contact. In this case, also, it may prove desirable to space wells more closely along the strike for the same reasons of better control of fluid movement as those given in the instance of gas cap displacement.

Field Studies

Briefly, the field studies may be summarized by the statement that in no field covered by the committees was there apparent any physical relationship between well spacing and oil recovery from a reservoir as a whole. In fact, three fields operating under a high degree of dissolved gas drive in which case any influence would, of course, be most apparent, gave every evidence that no such relationship exists. These were the PB-21 area in Venezuela, the Quiriquire field in Venezuela, and the Gloyd-Mitchell zone at Rodessa, Arkansas.

Both the PB-21 area and the Quiriquire field were originally drilled on a preliminary wide spacing, and the well spacing was later decreased by drilling additional wells interspaced between the original widely spaced wells. In the Gloyd-Mitchell reservoir a substantial number of wells was drilled after extensive decline had occurred in reservoir pressure, thus affording an opportunity for analysis of the effect of the later wells on ultimate yield. Careful study of the probable ultimate recovery to be obtained from these three reservoirs, as estimated by both production and pressure decline curves, did not indicate any material change as a result of the later drilling. This evidence alone was not considered conclusive, owing to possible uncertainties in extrapolating decline curves, but, to supplement the latter, there were data showing close agreement between pressures and saturation at the original wells and the later wells, at the time the later wells were drilled. It was found that the initial subsurface pressures at the later wells were only slightly, if at all, higher than the then existing pressures at the original wells, even though the pressures at the original wells had dropped several hundred pounds below the virgin reservoir pressure. Likewise, the gas-oil ratios were approximately the same at the later wells as those currently obtaining at the original wells, this fact being strongly indicative of similar relative fluid saturations under the workings of the saturation-permeability relationship. Completion of the later wells increased the field rate of production, but this served only to accelerate depletion.

With regard to the effect of well spacing on recovery in the two displacement mechanisms, no direct evidence was obtained because no clear cut examples of a preliminary development with later fill-in drilling after the reservoir was partly depleted were available for study. However, several reservoirs having partial displacement drive provided indirect evidence, particularly the Lucien Field, Oklahoma, wherein comparison of two separate and differently spaced segments (40 acres vs. 10 acres per well) failed to show any relationship between spacing and recovery. Broadly supplementing such data is the common knowledge that in numerous fields there are examples of closed-in wells, located in areas of water or gas-cap encroachment, going to gas or water while on such closed-in status, reflecting the principle that it is primarily the displacement action and not well distance or spacing that governs oil recovery in the two displacement mechanisms.

In view of the direct evidence obtained from the field studies for dissolved gas drive fields, plus the qualitative evidence for fields producing by the displacement mechanisms, and considering the range of from 2.4 to 180 acre spacing studied, the conclusion reached by the Committees was that the theory reviewed here had been substantially borne out by the field behavior data.

Conflicting Theories On Drainage

It is of interest to consider the foregoing in contrast with the data gathered by others in various old fields showing that within a given field there was often a distinct difference between the oil recovery from properties with very close spacing and those with wider spacing, a broad picture usually tied in with the old "Cutler's Law." These data were often taken to indicate that within a given continuous reservoir the ultimate oil recovery expectancy varied directly with the number of wells. This supposed relationship between spacing and recovery has now been found to be due solely to normal regional drainage within the reservoir, induced simply by the creation of low pressure areas under the leases having the most wells; the result was a widespread influx of oil from adjoining portions of the reservoir but without change in recovery from the reservoir as a whole. In principle, this picture is analogous to that of several operators drawing oil from a common storage tank; the one connected to the most drawoff valves could be expected to secure more of the stored oil than the operators draining through fewer valves. It is not unusual to find very closely spaced tracts reported as yielding considerably more than 100 percent of the oil which could have been contained in the sand under these tracts, an obvious reflection of regional drainage.

A theory advanced some years ago postulated that, in the absence of water drive as a supplemental energy source, capillary forces would prevent further flow of oil and gas when the pressure

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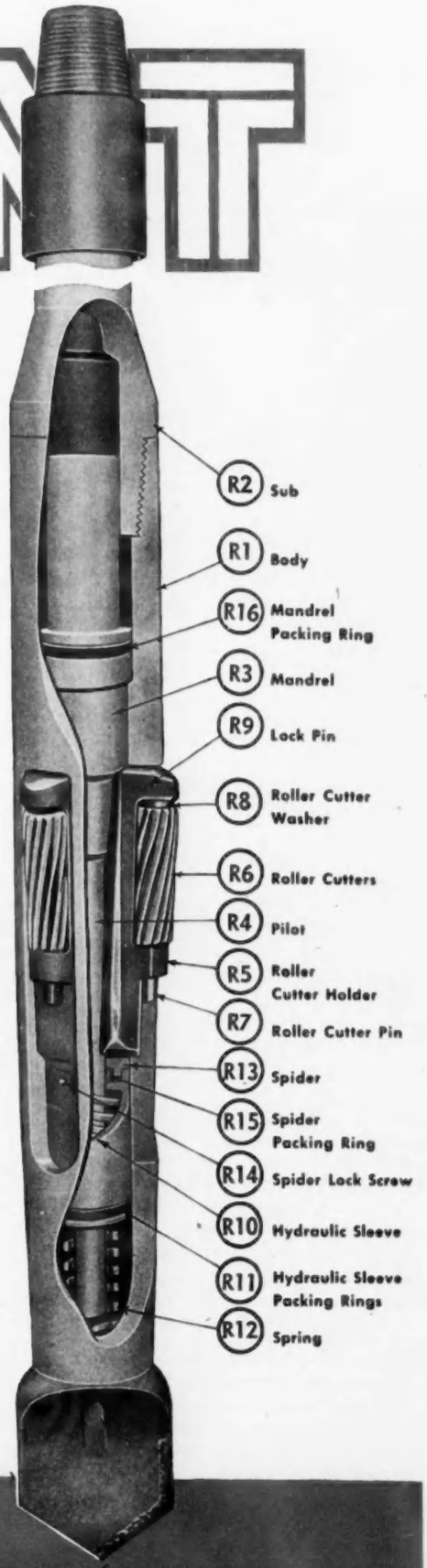

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differential reached a distance from the well at which the pressure gradient was offset by the capillary resistance to flow, thus setting up a definite drainage radius. To the committees' knowledge, this concept has never been supported by any clear-cut factual field evidence of such a phenomenon, and no evidence whatsoever of such a condition was encountered in the wide range of reservoir conditions and well spacing covered by the Pool studies. If the capillary control theory has any basis whatsoever in fact, of which there is no indication in available research data, it is believed that it must be only in abnormal reservoirs and not within any spacing range likely to be considered commercially practical.

There has also been advanced in the past a theory which postulated that since more energy is required to move fluids over greater distances, wide well spacing would use up more energy in moving oil to the well and hence result in lower ultimate oil recovery due to the depletion of energy in the reservoir. This premise can be shown to be inapplicable in the majority of oil reservoirs for several reasons. Chief among these are first, the fact that in radial flow the velocity of the fluid decreases very rapidly with distance from the well, and the energy required to move a particle of oil to the well from, say, 2000 feet away from a well, is only negligibly greater than that required to move oil to the well from, say, 500 feet; second, in practically all commercial oil reservoirs, the gas dissolved in the oil has an energy equivalent far greater than that which could possibly be used up in moving oil to a well, most of the remaining energy being wasted at the choke. The minor changes in energy consumption with distance from a well will have no appreciable effect upon oil flow where a super-abundance of energy is available from gas in solution. Furthermore, it will be appreciated that, in the gas displacement and water drive mechanisms, the supplementary sources of energy also aid in moving oil through the sands; hence, the matter of energy consumption in oil drainage may normally be regarded as of negligible importance.

Well Spacing Programs

Once the principle is accepted that well spacing of itself, that is, the simple problem of distance between wells, does not physically affect the ultimate recovery from an oil reservoir, it becomes apparent that the choice of a specific well spacing program for a given field may be based upon:

First, the number of wells and their location to meet the requirements of reservoir efficiency.

Second, the influence of economic considerations, involving depletion time, economic limit, and optimum return on well investment upon the foregoing requirements aimed at maximum efficiency, this point really being a phase of the economic balance on reservoir efficiency discussed in Part II—Section D.

The minimum number of wells required to give high reservoir efficiency in practice will vary over a wide range, because of the widely varying characteristics encountered. In a dissolved gas drive reservoir, for example, well location and spacing are of relatively minor importance, and the drilling of many wells, rather than few, serves largely to reduce depletion time; hence, choice of spacing becomes an economic problem involving time and investment cost. In the case of the two displacement mechanisms, to allow per well rates low enough to insure individual well efficiency, an adequate spacing program would require that enough wells be drilled and so located as to permit the realization of the desired total field withdrawal at efficient per well rates.

While the foregoing is largely concerned with the subject of minimum number of wells, it can be appreciated that too close spacing, that is, too many wells, may indirectly result in actual loss in ultimate recovery. Such a condition might arise if an excessive number of wells were drilled, since even fairly low per well rate of production might add up to a total rate far in excess of the efficient maximum for the field and thus bring about the previously shown adverse effects on ultimate economic yield from the reservoir.

In gas cap drive and in water drive, if the efficient rate for a field falls within the limitations demanded by economic considerations, and an operating program follows the dictates of efficiency through the field's life, any spacing wider than that required to meet these considerations would result in inefficiency on the part of the individual wells due to excessive withdrawal rates, while any closer spacing would result in unnecessary investments. If, however, the ideal rate for a reservoir were found to be impractically low and that it would be necessary for economic reasons to operate the reservoir at a total withdrawal rate above the level of maximum recovery efficiency, the well spacing problem in such case would resolve itself into one of endeavoring to meet the imposed field production rate while not exceeding the limit of efficiency in per well rates.

Each field or area requires individual study for determination of the economic questions bearing on the specific case. In a broad sense, well spacing or number of wells has an influence on depletion time, hence on economics, somewhat as do sand permeability and oil viscosity, in that closer spacing may permit shorter depletion time to attain any given cumulative yield. The study of this relationship in a specific field would result in spacing versus profit comparisons which would indicate the optimum spacing program for the existing conditions of depletion time and economic limit.

It may be of interest to observe that the committees' review of the fields covered by the Pool studies as well as their broad consideration of general experience throughout the industry, indicates that the well spacing employed in most old, and some new, fields has been much closer than necessary or desirable from an economic standpoint.

PART IV
Data Required for Reservoir Studies

AS ONE result of their studies, the committees found it highly desirable that the securing and recording of reservoir information be maintained in all fields on a scale sufficiently adequate to permit its intelligent interpretation and application in the analysis of reservoir behavior.

In weighing the expense and effort entailed in obtaining dependable reservoir information, it must be borne in mind that pool studies are not merely projects of academic interest but are, in effect, reserve estimates that have reduced to a minimum the assumptions and extrapolations generally accepted as an integral part of reserve estimation. Pool studies not only yield better estimates of oil in place but also enable more accurate estimation of possible percentage of reservoir oil to be recovered by the recovery mechanisms which may be operative under various exploitation programs.

In general, the information required for dependable analysis of a reservoir falls into four broad groups:

(a) Characteristics of reservoir structure.

(b) Characteristics of reservoir fluids.

(c) Pressures and temperatures.

(d) Statistical data on exploitation operations.

All of these are needed to present a reasonably complete picture to the analyst, and the use and interpretation of one is usually dependent on the others.

(a) Characteristics of Reservoir Structure

The general function of this information is to provide a picture of the reservoir itself, assuming that "reservoir" in this sense includes the total continuous extent of sand accumulation without regard to the fact that large portions of the sand may contain only gas and water.

Considerable effort should be made to obtain a clear understanding of the

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All men engaged in production and drilling are eligible (and men in the Armed Forces who were previously engaged in these branches of the oil industry).

Each contestant is limited to one entry.

All entries must be postmarked not later than March 15, 1944.

All entries must be submitted on the attached coupon.

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regional geology to determine the relation between it and the oil reservoir proper, especially as regards outcrop of reservoir sands, extent of the underlying water sheet, and to recognize the presence of folding, faulting, changes in sedimentation and other geologic features which may have an important effect on the behavoir of the oil reservoir.

Evaluation of the oil reservoir must begin with the determination of the volume of oil bearing sand. In determining sand thickness, electric logs, coring, cutting samples, and driller's logs should all be considered to insure the most accurate estimate. It is also important to distinguish between overall and net sand thickness, the latter preferably being clean and permeable sand as contrasted with shales and sandy shale which may yield very little oil and, when included in sand thickness figures, lead to appreciable errors in reserve estimation and studies of recovery efficiency. It is strongly recommended that adequate coring programs supplement electric logging. The areal extent of the oil reservoir can be determined definitely only by drilling, and it is of great importance that the drilling program be designed so as to outline the productive limits as soon as possible after active exploitation of the field is started.

The cores obtained should be subjected to complete analysis, including porosity and permeability, saturations of oil, gas and water, and chlorides content. Samples of formation water should be analyzed for aid in determination of original connate water content. A well-balanced coring program will give the operator, through the results of complete core analyses, a fair idea of the character of the sand and its fluid saturation and may, therefore, have an important bearing on such operations as gas injection, water flooding, acid treatment and other field developments. It is important to note variations in sand characteristics, such as alternate tight and permeable streaks and changes in saturation, for their influence on depletion estimates and on various aspects of the control of fluid movement in the sand.

(b) Characteristics of Reservoir Fluids

This group covers the nature of reservoir fluids—the flash and differential liberation of dissolved gas, oil shrinkage, viscosity of reservoir oil, and complete hydrocarbon analyses on the reservoir oil and analyses of samples of the gas in free gas caps. These data are necessary for the prediction of future behavior of the oil body and are required for any real understanding of a field's behavior, regardless of the approach employed in the study. To obtain these data, it is essential that samples of reservoir fluids be obtained and analyzed before the depletion of a reservoir has proceeded to any great extent. The samples should be taken from early wells so distributed as to locate regional variations before any substantial quantities of oil have been produced. It is usually difficult to estimate the original fluid characteristics accurately from samples obtained after considerable pressure decline, and data on the nature of the original fluid may be extremely valuable in checking behavior trends throughout the reservoir. Because seriously misleading conclusions may be drawn from inaccurate subsurface sample analyses, it is essential that all precautions be taken to insure the obtaining of truly representative samples. This may often be possible only by careful consideration of well conditions and checks against other sample data. Following the original determinations, samples of reservoir fluids should be obtained periodically during a field's life for checking on reservoir behavior.

(c) Pressures and Temperatures

Original reservoir pressure and temperature should be obtained as early as possible, preferably from tests in the initial wells immediately after completion. As development proceeds, a routine should be established for pressure surveys at suitable intervals to evaluate recovery efficiency and its control. The interval between surveys should not exceed 12 months in any field and where conditions are known to be changing rapidly or where major changes in operating practices are introduced, surveys should be made more frequently, at intervals best adapted to the particular field. As in the case of samples of reservoir fluids, it is important that reservoir and well conditions be considered before interpreting subsurface pressure measurements, so as to insure the greatest possible accuracy in their use.

In the development of a field, dry holes are frequently drilled on the edge of production or, in some cases, a considerable distance from production. Subsurface pressure measurements in such wells are valuable and should be obtained at every opportunity as they indicate the potentialities of a water drive. Subsurface pressures should also be taken periodically in closed-in wells, as such data are useful in studying the effectiveness of the well spacing, regional drainage, and degree of depletion at points remote from the producing wells.

Aside from the measurement of static pressure in wells for the determination of reservoir pressures, such studies as flow and interference tests should be carried out to establish the general nature of the wells' performance characteristics. Flow tests for productivity factor determination should be made on at least 10 percent to 15 percent of the wells and, if feasible, on each well immediately upon completion. Periodic retests during a well's life also provide useful information. These data, in addition to aiding efficient production of wells, also indicate changes in conditions around the well bore.

(d) Statistical Data

No less important than the technical data on the reservoir are the statistical data on operations, such as records of oil, gas, and water production and well completion reports, together with changes required in the reports as the result of workovers or other mechanical repairs and changes. There has been, in the past, a tendency in many areas to neglect data on water and gas production, and sufficient care is not always exercised in test procedure. Consequently, reported gas-oil ratios and water percentages are often misleading. In the final analysis interpretation of technical data obviously can be no better than the accuracy of the statistical data. The bulk of statistical data regarding production and, to a lesser degree, data on the mechanical status of wells have to be compiled for use in other than strictly operational studies but are not always tabulated in the form best adapted to reservoir study work. Some duplication is necessary, therefore, since it is desirable that the reservoir analyst have his statistical data so assembled in charts and tabulations that a ready record of production, pressure decline, and the various trends is available. Sources of error should be eliminated and proper distribution of responsibility should be enforced so that accurate and complete statistical data will be maintained.

Certain information must be obtained as early as possible, and it must be accurate. Data on original conditions, required for practically all studies, cannot always be estimated satisfactorily after depletion has advanced. They must be obtained at an early stage and should be considered as much a part of well completion as the initial gauge. Accuracy of information is stressed to avoid the tendency to overlook the importance of dependable information and the resultant failure to exercise requisite care in securing and recording information. Considering that the cost of obtaining and recording complete information on wells and their performance is a very small part of drilling and producing expense, careful compilation of all pertinent data is very low cost insurance that operation of the reservoir will be as efficient as possible under the general economic conditions prevailing during its producing life.

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PRACTICAL OPERATING *Hints* FOR THE DRILLING RIG

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1. BOILER OPERATION

Screen Aids Firing In Exposed Sites

INCREASING the heating and fuel consumption efficiency of a group of boilers is the much-sought-after aim of every operator, particularly if no additional construction or equipment is involved. What was at first meant to be a security measure in compliance with black-out provisions in one of the coastal fields has proved to be a valuable working idea since the black-out measures were discontinued a short time ago. Boiler efficiency has been increased appreciably, and at practically no cost in either labor or material.

To cut down unwanted glare at night near the front of the boilers, a sturdy, light tripod-like framework had been built, the front side being covered with a sheet of corrugated iron, and the unit

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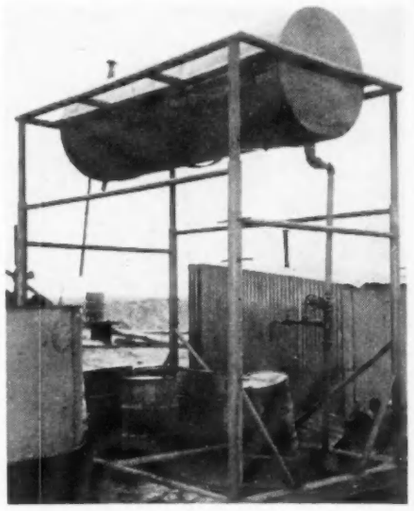
set up in front of the unprotected firebox opening of each boiler. Shortly after this system was begun, an improvement in operating conditions was noted, fuel consumption was lowered and temperature control was held much easier. Upon investigation it was found that small drafts originating from the small draws and canyons nearby had a detrimental effect upon the combustion. With the shields in place, fuel valves could be held to a fraction of a turn and regulation problems were minimized.

Even in supposedly sheltered areas, enough air currents may be detected, upon close checking, to warrant the use of some type of shelter. Experimenting will show the size of shelter to use—there being an optimum size where the maximum protection will be afforded, yet providing an ample supply of air for the firebox. While the present set-up is only temporary until more permanent shields are built, they are effectively conserving fuel and making operations easier for the fireman in controlling his battery.

2. FUEL HANDLING

Adjustable Support Insures Fuel Feed



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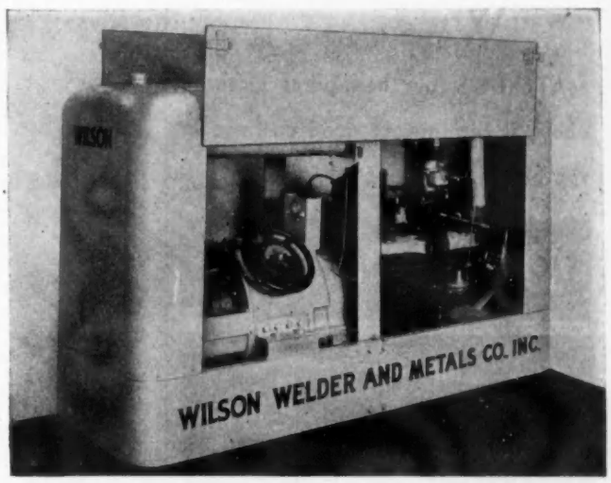

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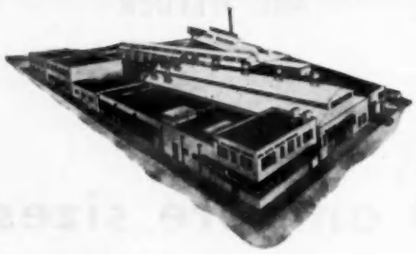

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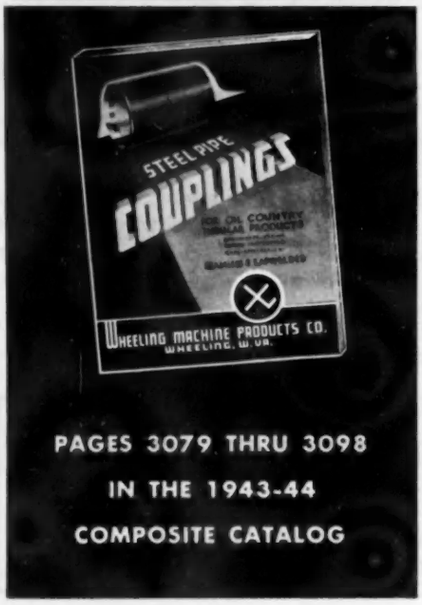

PAGES 3079 THRU 3098
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COMPOSITE CATALOG

close limits of the same height regardless of ground levels, one company makes an adjustable support for the fuel container, with the upper section of the telescopic mount sliding within the heavier base posts and adjustable by means of paired heavy pins through matched holes at each corner.

The frame is elevated to the desired height with the truck winch, or by jacking under the empty fuel tank, and then pegged or pinned by driving the locking bolts through the proper pair of holes. Transverse braces hold the lower posts in alignment, while the tank support affords desired rigidity to the top.

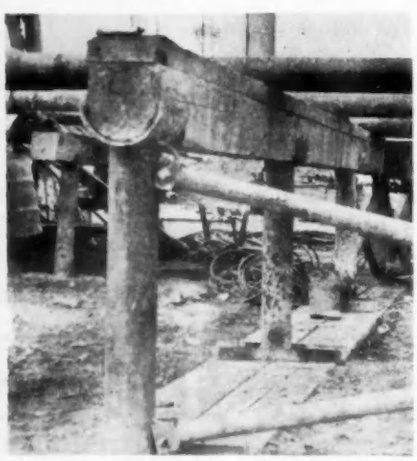
A swing in the outlet pipe absorbs minor shifts in tank-ground relation as the container is filled with fuel, while a combination vent and overflow at the opposite end guards against overfilling of the tank when fuel is pumped in through the same line as used for distribution.

3. *PIPE STORAGE*

Timber Section Cuts Steel Requirements

REDUCTION in the amount of steel required for pipe racks has been secured by substituting timbers for the footing and top member, without sacrificing the strength and ready portability of the steel supports. The T-base of the standards is made of wide channel, long enough to distribute the loading across adequate timber sub-base, with the top of the uprights being made of a half-section of 6-inch pipe, concave side welded uppermost.

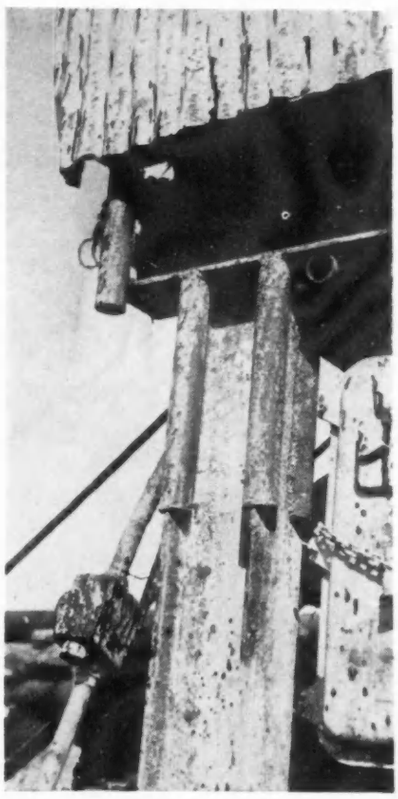
The 6x6 or 6x8-inch timbers used for transverse members are formed to fit the saddles on the posts, and are shod on the top or wearing surface with a section of light channel carrying an end shield to prevent displacement laterally of the steel cap.



Saddles on uprights carry formed timber member which, steel shod, affords strength without increasing rolling load.

4. *LINE CARE*

Scuff Plates Save Hoisting Equipment



Sections of pipe, split longitudinally, are welded on corner beam members to prevent fraying of contacting lines.

PROLONGING the life of cables and hoisting slings in their rig-moving equipment, one company has developed a means of preventing unnecessary scuffing and tearing of the lines while lifting or skidding heavy derrick base sections. On the exposed sharp corners of each section, against which the cables would grip tightly, were welded 18-inch lengths of 2-inch pipe. Split down the side and spread apart just far enough to permit being slipped over the sharp edges of the framework, the lengths of pipe were tack welded in place at several points to prevent their being pulled off easily, yet lightly enough to allow their being removed should the beams be needed for other purposes.

This method of protection is being used to good advantage on smaller, portable units where most of the moving depends largely on handling large unitized sections of the mud equipment and derrick floor structures. The slight cost of this preparation in advance of moving is more than repaid by the added life and usefulness of the cables and cordage used in moving operations.

Multi-Bin Workbench Simplifies Segregation of Rig Pipe Fittings

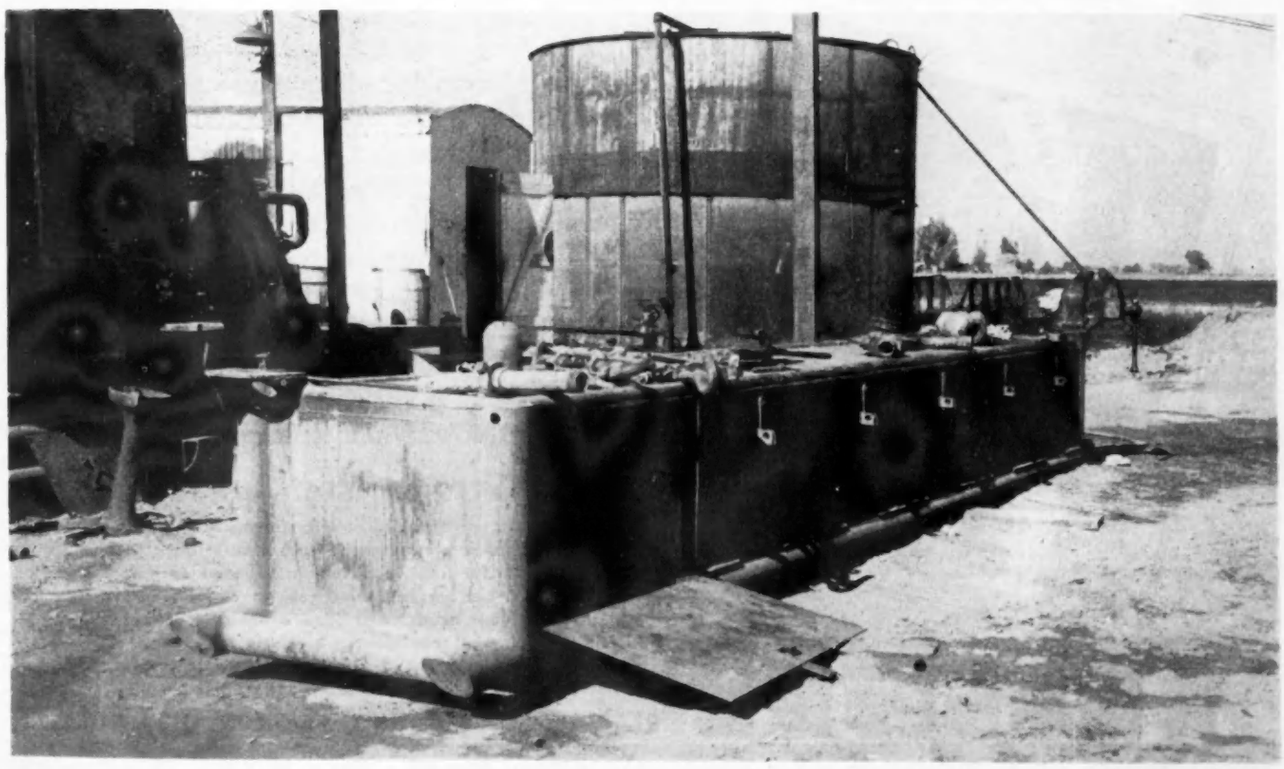
Storage by assorted items in compartments instead of mass transfer in "junk box" saves time when rigging up or servicing equipment, and prevents breakage of smaller units

WHENEVER a pipe fitting is needed around a drilling rig it usually is needed at once and little time can be spent in searching through heaps of miscellaneous fittings. To help eliminate the possibility of wasting time during such emergencies, one company built up a long skid-mounted multi-bin steel box which serves both as storage space and sturdy workbench.

The rectangular, all-welded structure was built up from used 3- and 6-inch casing and divided into six compartments by welding in ¼-inch sheet steel partitions. Each compartment opens to the one side by a hinged downward-opening door, and each is meant to carry a certain size—or range of sizes—of fittings that are most likely to be needed on that particular rig. One of the bins is designed to carry spare belting, gasketing and packing supplies. On two diagonal corners on the top of the bin are mounted heavy steel plates on which large vises may be mounted. The broad flat space between them provides ample bench space on which to lay out the work.

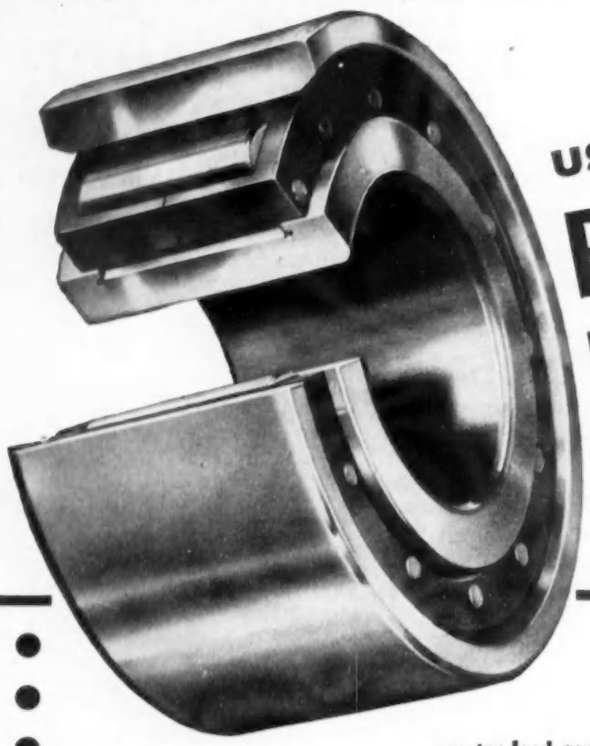
The bins have identical latching devices and are designed to give maximum protection against thievery with a minimum of moving parts. A perpendicular flat lug welded to the outside of the door is matched by a similar lug which turns on a pin extending through to the inside of the cover. Rotating the outside arm through 90 degrees brings a steel finger into a slot in the upper side of the bin framework to form a positive-acting, secure lock. Each of the two lugs on each door has a matching ⅞-inch hole cut into it, and when the latches are in place, these holes are in alignment all the way down the front of the bin. When the well is left with no one guarding the equipment a long bolt, made from a section of sucker rod, is run through the aligned lugs and then locked on one end, thus securing all the compartments at one time.

When the rig is being moved to a new location, all special fittings, regulators, gauges, and similar delicate instruments may be placed in the bins and hauled off on a truck in a single compact load.



Sturdy skid frame supports uprights carrying separation panels while heavy doors, hinged at their bases, provide secure enclosure of heavy materials while skid is being winched on truck or lowered to storage site at drilling operations.

Design Now for Higher Hourly Production After the War



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- All thrust loads carried at right angles to the roller axis

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☆ ☆ ☆ ☆ WASHINGTON ROUNDUP ☆ ☆ ☆ ☆

PETROLEUM Reserves Corporation and its entry into the oil industry were the major and practically the only subjects of oil discussion in Washington last week, and bid fair to hold the spotlight for some time to come.

Announcement of PRC's agreement to build a Mediterranean-area pipe line brought new blasts of criticism from the Capitol, where a Senate subcommittee is scheduled to hear Administrator Ickes' explanation of the policies, program and operations of the agency on February 15.

The long-term arrangements contemplated in the agreement between PRC and Arabian American Oil Company and Gulf Exploration Company led to expressions of fear in congressional and industry circles that PRC, now merely a temporary war agency, would be added to the long list of permanent government bureaus and become an active operator in the foreign oil industry.

Countering these charges, Ickes insisted that the policy of PRC is to aid the private oil industry, with which it does not propose to compete.

Retention by the government after the war of the pipe lines, rubber plants and other facilities in basic industries is suggested in a report of a special Senate committee on postwar economic policy and the disposition of surplus government property, on the basis of which legislation is now being drafted.

No plants should be so disposed of by the government, the report held, as to disorganize any industry or permit any monopoly.

Perpetuation of PRC Seen in Middle East Pipe Line

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Investigation Committee Plans to Hear Ickes Tuesday

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Brewster and Moore Move for Full Probe of World Oil

»

PIWC Asks Oil Companies to List Own Expenditures

»

By B. F. LINZ,
Washington Correspondent

☆ ☆ ☆ ☆

Investigation of Whole World Oil Situation Is Aim of New Resolution

The attack on Petroleum Reserves Corporation intensified last week, following announcement of its plan to build a pipe line in the Middle East, (see next page), with Senators Brewster of Maine and Moore of Oklahoma, authors of a resolution for liquidation of the agency, introducing another resolution calling for a comprehensive investigation of the whole world oil situation.

The committee would consist of three members, each, from the Senate committees on foreign relations, interstate commerce, and commerce, instructed to make a full and complete study "of petroleum resources, and the production and consumption of petroleum and petroleum products, both within and outside the United States, in their relation to our national welfare and security," and to make recommendations for the formulation of a national petroleum policy.

Discussing the resoltuion on the floor of the Senate February 9, Brewster disclosed that the forthcoming report of the Truman committee, embodying the results of an eight-month study of oil, would charge that the PRC pipeline agreement was contrary to Secretary Ickes' statement in a letter to the committee that "if materials can be made available, it is hoped that the necessary pipe line and refinery capacity can be considered so that the British oil reserves may be drawn upon to a greater degree."

Under the agreement, the Senator pointed out, the withdrawals would be from American and not British reserves and, he added, "if the pipe line is to be used for servicing certain British reserves in this area, it is a matter which I think our appropriate legislative committee must consider."

Brewster drew from Senator McKellar of Tennessee, chairman of the appropriations committee, an admission that no funds have been provided for the building of a foreign pipe line.

"I feel that this is a matter which must have the very serious consideration of the Senate, as I do not understand it to be concerned with the current war effort, since I think the Senator from Oklahoma (Moore) will confirm the statement that from 18 months to 2 years would be required to build this 1,200-mile pipe line and make the refining facilities available in connection with it," Brewster said. "Embarking upon so stupendous a project constitutes a radical reorientation of our foreign policy.

Renewing his attack on Ickes, Senator Moore charged that the Secretary had repeatedly assured the Petroleum Industry War Council and the industry that PRC had no plans for actively engaging in the oil business, and as late as February 3 told the council's national oil policy committee that it had no such plans. A day after the secretary of state had told a group of oil men (THE OIL WEEKLY, Feb. 7) that the government would take no action concerning a foreign oil policy without consulting the industry; at the end of the week, however, Ickes announced the PRC agreement.

"The contract between Petroleum Reserves Corporation and the American oil companies, in effect, makes the United States a partner with the three companies involved," Moore charged, warning that it will be necessary to make treaties, construct facilities for the maintenance of a force of civilians to build and operate the line and troops to protect our interests while, in the event of another war, our enemies might have the benefit of a ready-made military facility.

"The pipe line and the necessary pump stations," he added, "will consume thousands of tons of steel for which our own American oil industry is begging. Every day, oil men are being refused material and equipment for development in this country. It grows more apparent that our oil scarcity at home is a planned shortage."

Under the agreement, Moore told the Senate, the government will have a complete monopoly of the companies' entire oil reserves in the Middle East, but from an economic standpoint it is a bad deal for the government since the 2500-mile haul that will be saved will not offset the additional cost of pipeline transportation.

"If this had been a commercial enterprise, there would have been no difficulty in obtaining the assistance of other American companies in order that the cost and hazards might be spread," he pointed out.

Moore also pointed out that the deal commits PRC to a 50-year program in the face of the fact that the authority by which the agency was created terminates on January 22, 1947, thus paving the way for perpetuation of an agency ostensibly designed merely as a war facility.

"The question naturally arises as to what the government will do with the oil it has bought," he went on, "No doubt, Mr. Ickes and his corporation will hide behind the answer that it is a military secret."

The Senator pointed out the probability that the government will have to build a refinery on the Mediterranean to use the oil moving through the pipe line, a probability which, he said, he had every reason to believe is being considered by the "White House planners," and then it will be necessary to market the product "and in the end we will have a government corporation engaged in a fully integrated business."

"The truth is that the White House

U. S. Takes Option on Quantity of Oil For Financing Middle East Pipe Line

Petroleum Reserves Corporation last week set the pattern for its foreign oil operations in an agreement with Arabian American Oil Company and Gulf Exploration Company for construction by the United States government of a pipe line from the Saudi Arabia and Kuwait oil fields to the eastern end of the Mediterranean at a cost between $130,000,000 and $165,000,000.

As outlined by PRC President Ickes, the agency's policy will be one of aiding the oil industry in its foreign operations without entering into competition with it.

"Petroleum Reserves Corporation does not propose to compete with the private oil industry of this country," Ickes stated flatly. "On the contrary, its purpose is to promote the private oil industry of this nation, and to further the interests of the people of the United States."

In order that the country might have no doubt of PRC's intentions, Ickes made public the agreement in principle between the government and the oil companies, which provides that the latter shall set aside a reserve of 1,000,000,000 barrels, or 20 percent of the reserve if less than 5,000,000,000 barrels, for sale to the government at 25 percent under the market price in the Persian Gulf region or of similar crude in the United States, whichever is lower, and will return to the government through charges for service, the entire cost of construction plus interest within a period of 25 years, together with such net profit to the government as may be agreed upon.

"I hope the announcement and publication of this agreement in principle will eliminate once and for all the apprehensions which have been caused by the organization and activities of Petroleum Reserves Corporation," Ickes said. "We are making this announcement of our plans and program as soon as possible in view of the complicated negotiations affecting many agencies of our own and other nations. Premature publicity in this situation might well have made it impossible to conclude the arrangements.

"Aid Private Enterprise"

"The policy of Petroleum Reserves Corporation is to aid the private oil business of this country by seeing to it that so far as the foreign oil situation is concerned, the interests of the United States and its military forces are protected, and to do what can be done consistently with the foreign policy of this government as administered by the Department of State, to aid the private oil industry of this country to obtain against future contingencies an adequate supply of foreign oil."

Announced as the Johnson subcommittee in charge of the Moore-Brewster resolution for liquidation of PRC, postponed its hearings to February 15, the agreement, which it was emphasized must yet be sanctioned by the rulers of Saudi Arabia and Kuwait, brought only further criticism from Senator Moore of Oklahoma, co-author of the measure, who asserted the project would cost $500,000,000, rather than the relatively small sum estimated.

Under the agreement, the government will construct, own and maintain the pipe line and exercise supervision over its operation. The facilities will be made available to other oil producers and shippers in the area upon assumption by them of their proportionate share of Arabian American and Gulf's responsibilities.

The government will have the right to exercise its option for the 1,000,000,000 barrels reserved for it over a period of 50 years, at the rate of 30,000,000 barrels a year, and in time of war or other national emergency may take the companies' entire production, at a price to be agreed upon. The companies agree not to sell crude oil or products to any government or the nationals of any government when, in the opinion of the Department of State, such sales would be unwise in the light of United States foreign policy and the requirements of collective security, and to conform their commercial and other policies and practices to the foreign policy of the government.

The companies themselves are to construct no additional main pipe lines for the westward transportation of crude from Saudi Arabia or Kuwait unless the capacity of the proposed line is insufficient to meet their requirements and the government declines to install additional facilities, and in any event are to utilize the government system to the fullest extent of its available capacity should additional lines be required.

Senator Is "Appalled"

Nothing in the agreement is to require action by the companies in violation of their covenants with the Saudi Arabia or Kuwait governments or, in the case of Gulf Exploration Company, of its contracts with the British government or corporations in which the government has an interest.

The agreement, Ickes said, was recommended by the War and Navy departments, the joint chiefs of staff and the Army-Navy Petroleum Board and was approved by President Roosevelt and the State Department.

Senator Moore expressed himself as "appalled" that any American companies would "commit themselves to such a program."

"The contract in effect makes the United States government a partner with these companies in the development of their concessions in that part of the world," he asserted.

"This is entry by the government in the oil business. It will not receive the support or respect of the oil industry."

Senator Brewster of Maine, co-author of the PRC liquidation measure, withheld comment as to the desirability of the project, but declared "it represents a tremendous departure from American traditions, and a radical change in our foreign policy, and for that reason I think it should receive careful consideration.

"To engage in such an enterprise is far too important a matter to be left to a committee by the executive branch of the government," he said. "It should receive the attention of Congress as well."

The project also was the subject of some criticism in industry circles, where the question was raised what the government might do with the 30,000,000 barrels of oil a year which it has under option.

Oil men pointed out that provision of the agreement giving the government the sole right to determine when and the manner in which the reserve is drawn upon and permitting it to determine "that said reserve has no relation to the purchase of petroleum made by the military forces from year to year in the normal course of supplying their requirements."

Under the broad provisions which PRC has written into the agreement, it was suggested, the government readily can get into competition with the industry, and fears were expressed that at some future time the government might decide to take the oil at the low price at which it can buy it and sell it on the market in competition with domestic oil.

The agreement will be exhaustively investigated by the Johnson subcommittee, but also will be studied by the Truman committee, now engaged in preparing a report on post-war world oil development which is expected to be issued about the end of this month. The report is being written by Senators Brewster and Mead, who were among

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planners visualize the socializing of the oil business and our other basic industries, including transportation and communications."

At a press conference February 10, Ickes expressed confidence that Moore would disqualify himself from serving on the Johnson subcommittee on the PRC liquidation resolution on the grounds that he would be serving as prosecutor, jury and judge, and that he is an independent oil man with a personal interest in the matter.

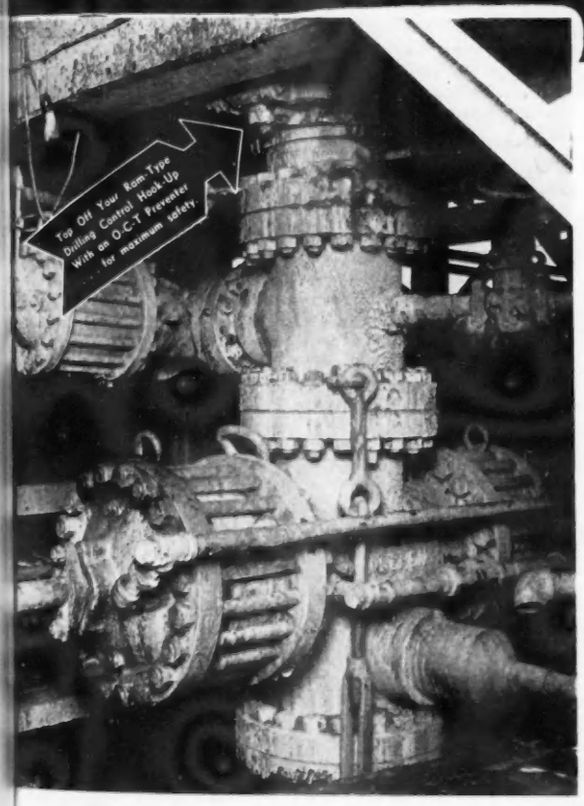
Ickes charged that Moore was being helped in preparing his "blasts against PRC by a former Stanolind lawyer."

The Middle East pipe line will probably be of 24- or 26-inch calibre, Ickes said, but explained that both its size and its route are engineering questions which have not yet been gone into. The definite contract with the companies is now in its preliminary stages, he said. Asked whether any cartel arrangements would be involved in the project, he inferentially denied that any agreements for division of markets would be made by the United States and other countries and declared that the Gulf contract with the British is one of "exclusion from markets." Rumors were current in Washington, however, that cartels were being talked in some government circles as a means of easing the restoration of normal conditions internationally after the war.

Ickes indicated that his testimony before the Senate subcommittee would be general in nature and that no disclosures of details of PRC's policy or program would be made in open session.

Insure Against Blowouts

WITH AN O·C·T BLOWOUT PREVENTER



Operations in wildcat or proven high pressure areas should have the added protection afforded by O-C-T Blowout Preventers. Installed above ram type drilling control units, O-C-T Preventers fill three vital needs: (1) They provide a dependable secondary seal against destructive well pressures. Should the ram type seal fail for any reason, the pack-off in the O-C-T Preventer is capable of sealing off against highest well pressures. (2) While rotating and working pipe under pressure to prevent sticking, the ram type preventer may be opened to relieve the ram packers of wear and tear. The O-C-T pack-off is relatively inexpensive and more easily replaced. (3) When equipped with a stripper type pack-off, drill pipe, casing or tubing may be run in or out of the hole under pressure.

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the five members of the Senate who made a world tour of battlefronts last summer.

Name Is Changed

Arabian American Oil Company is not a new organization but merely a new name for California Arabian Oil Company. A petition for formal change of name has been filed in Wilmington, Delaware, where the corporation was chartered.

The Arabian oil is not destined for immediate importation into the United States, but may prove a desirable source at some time in the future, it was indicated by H. D. Collier, president of Standard Oil Company of California, in commenting on the agreement.

"Arabian oil appears destined for an important role in world affairs, not only in meeting United Nations' war needs but as a source of supply in the event of future American shortages," Collier said. "Government cooperation in building a trunk-line across Arabia for transportation of crude oil produced by American companies in the Middle East will bring the oil much closer to the Western Hemisphere and will make it available for a time when domestic scarcities may be more acute than at present."

Foreign Secretary Anthony Eden indicated February 9 that Great Britain had not approved the proposal to construct an American pipe line from the Persian Gulf to the Mediterranean and agreed with members of the house of commons that the government would be profoundly concerned about any such project so deeply affecting British interests. Some parliament members seemed anxious lest the United States might acquire sovereignty over territory to be occupied by the proposed pipe line. Eden said it was obvious that consultations with all governments concerned would be required when asked if it would be necessary to obtain concurrence of the British government.

Confers With Halifax

As the controversy over foreign oil flamed up British Ambassador Lord Halifax and Secretary of State Cordell Hull were reported to have conferred on the PRC pipe-line project, and it was rumored that groundwork for American-British international oil operation was laid during last summer's trip of President Roosevelt to Teheran and Cairo.

At the former meeting, it was said, Russia also was apprised of the country's oil plans, the inference being that the big three of the United Nations would work in agreement. Such a plan, however, it was pointed out, did not take into account Holland, which also has important oil holdings.

At a press conference February 11, President Roosevelt defended the project, but denied the reports of discussions at Teheran and Cairo of Anglo-American-Russian world-wide oil operations.

Meanwhile, Acting Secretary of State Stettinius disclosed that discussions with the British of the near eastern reserves would shortly be initiated from which Russia, for the time being at least, would be excluded, presumably because the Soviet has no oil interests in that part of the world.

Stettinius said that formal announcement of the details for discussion would be issued in the near future. Such action, in contrast with the usual State Department policy of clamping the lid on all talk of international negotiations, was taken as indicating a recognition by the administration of intense public interest arising out of the disclosures and criticism of the government's oil activities.

One phase of the matter yet to be clarified was the attitude of the domestic industry toward the Middle East project. Asked at his press conference if he believed the Petroleum Industry War Council would withdraw its resolution demanding dissolution of PRC, Ickes said he would "be surprised" if it did, but added that a motion for reconsideration always could be made.

Supply, Transportation Groups of PAW Joined

Consolidation of the supply and transportation divisions of PAW, originally planned last December (THE OIL WEEKLY, January 3), was formally announced last week by PAW, with George A. Wilson, former transportation division head, as director of the new supply and transportation division.

At the same time, the responsibilities of the marketing division under Walter Hochuli were expanded and it was retitled the distribution and marketing division.

To aid in the supervision of the supply and transportation division, Dane B. Hodges of Shell Oil Company, New York, was named associate director.

Under the new set-up, for which the district offices and advisory committees have been reorganized, the supply and transportation division will be responsible for the movement of all available stocks of crude and products from supply areas to refiners and from refineries to distribution areas. The distribution and marketing division will pick them up at supply terminals and exercise full control from those points to distributors and consumers.

Hodges has had wide experience in supply and transportation operations in East Coast, Mid-Continent and Pacific Coast areas. Since 1940 he has been manager of transportation and supplies for the combined Mid-Continent and Atlantic Coast areas.

Company Expenditures Are Asked by PIWC

An extensive canvass of the oil industry to ascertain the total amount of capital expenditures, exclusive of federal financing, made by individual companies directly in furtherance of the war effort has been undertaken by the Petroleum Industry War Council, it was announced February 11 by Chairman William R. Boyd, Jr.

The study is being made, Boyd explained, to explode a popular misconception that government funds have entirely underwritten the new construction and expansion of the industry's wartime facilities.

A similar study made a year ago indicated that individual companies proposed to expend $673,000,000 in programs which, under normal circumstances, would not have been undertaken, to include $512,864,000 for war-created refining facilities, $136,661,000 for transportation facilities and $23,484,000 for accelerated distribution facilities.

"Mis-statements from persons not properly informed frequently relate that the government is financing the construction of new facilities and even the expansion of existing facilities for the manufacture of petroleum war products," Boyd said.

"Facts prove otherwise."

Since the last census by PIWC, he added, a number of new projects and additions to existing plants and facilities have been undertaken, further to increase the output of products for war.

"It has been found also in a number of instances that the final construction cost on new 100-octane plants and plants to produce raw materials for synthetic rubber will be considerably different than as first estimated, requiring added private expenditure by individual oil companies," he said.

"This is additional evidence of the patriotic cooperation and individual initiative the petroleum industry has accorded the nation in its remarkable conversion from peacetime to wartime production."

It is also known that changes in the war program have necessitated cancellation of projects contemplated by the industry, and the survey is designed to secure as complete information as possible on the exact expenditures by individual companies solely to further the prosecution of the war.

Crucial Test Period For East Coast Supplies

Military oil demand on the East Coast is more than 300,000 barrels daily above that of a year ago, canceling out an increase of that amount in shipments into District 1, it was disclosed by PAW February 10 in its weekly supply bulletin.

The period of "crucial test" for East Coast supplies is now here, Administrator Ickes warned, and "from now on it will be a race between the limited transportation and the heavy winter consuming season."

No serious shortages have yet developed, he said, and there is still hope that the emergency measures which have been instituted will enable District 1 consumers to get through with only brief local shortages.

During the week ended February 5, overland shipments to the East Coast averaged 1,325,000 barrels daily, against 1,085,000 barrels in the corresponding week last year and 355,000 barrels in February, 1942.

Tank-car shipments dropped to 685,849 barrels a day, it was reported, a loss of more than 34,000 barrels from the preceding week. The drum movement of kerosine to New England is being stepped up rapidly and shortly will exceed 20,000 barrels daily.

The most promising augury for the future is the movement through the little-big-inch line, where the head of the column of heating oil from Texas passed Norris City February 8 and is now moving east at a little over 50 miles a day. Testing of the eastern leg has been completed and, barring accidents, the oil will reach East Coast terminals before the end of the month. Only half of the pumping stations have been completed, but it is expected that 100,000 to 150,000 barrels a day will flow through the line in March.

Lower Refinery Runs Bring Reduction in Gasoline Output; More Fuel Oils Made

Refinery runs were cut back in the week ended February 5, and the curtailment was reflected mainly in gasoline production, which was lower than in the previous week. As a result, the accumulation of gasoline in storage was subnormal for this time of the year.

In spite of charging less crude to stills than in the previous week, the refineries turned out increased volumes of both light and heavy fuel oils, which were clearly needed, by holding down gasoline production. Nevertheless, the current production of the fuel oils was short of current demand, and it was necessary to draw further on the already badly depleted stocks of residual fuel and to take from storage over a million barrels of gasoil and distillate fuel, which was a large withdrawal even for this heavy-consuming season.

Production of crude oil, like runs to stills, was comparatively low in relation to present record-breaking demand. The crude output averaged 4,400,000 barrels per day, down 9000 from the previous week, although 547,000 barrels or 14 percent above production in the corresponding week a year ago.

The runs to stills in the week of February 5 averaged 4,324,000 barrels daily, down 35,000 from the week before but 632,000 barrels a day or 17 percent above the runs in the like week last year. The plants of the nation were being operated at 89.5 percent of rated capacity.

Production of gasoline totaled 13,292,000 barrels during the week, a decrease of 135,000 (nearly 20,000 daily) from the previous week. However, the output was 400,000 barrels a day or 27 percent greater than in the corresponding week a year ago.

Stocks of finished and unfinished gasoline were increased by 100,000 barrels a day, and the week's addition of 699,000 barrels to storage left on hand 81,784,000 barrels. That was about 10 percent less, however, than the 89,696,000 barrels in storage February 6 last year, although demand will be materially greater in 1944 than it was in 1943.

Refinery output of gasoil and distillate fuel totaled 4,138,000 barrels in the week of February 5, having been 12,000 barrels a day greater than in the previous week. The production was only slightly larger, however, than in the corresponding week last year. It was low in relation to demand, and the industry found it necessary to draw on storage at the rate of 160,000 barrels per day, a total of 1,113,000 barrels having been withdrawn during the week. Left at 36,153,000 barrels at the end of the week, the stocks were close to the level at which they stood one year previously.

Production of residual fuel oil totaled 9,087,000 barrels during the week, indicating an increase of 28,000 barrels over the week before in the daily average output. The production exceeded that in the like week a year ago by 190,000 barrels per day or 17 percent. In spite of the comparatively large production, current demand was not met by current supply, and refiners took from storage during the week 123,000 barrels of residual fuel, an average of 18,000 daily. Having been reduced to 52,734,000 barrels, national stocks on February 5 were more than 18,000,000 barrels or 26 percent under the 71,095,000-barrel level at which they stood a year before.

Refined Markets Light; Wyoming Crudes Raised

Markets for refined products have continued extremely tight generally, in reflection of scarcities of both materials and transportation, and an unusual development of the past week was the authorization by OPA of higher prices for crude oil in two fields of Wyoming.

The Wyoming increases were explained as an adjustment to bring postings in Lance Creek and Salt Creek fields up to the same levels prevailing for other crude of similar quality in the same area. OPA said that purchasers in the fields were willing or able to absorb the increases and that there would not result any increase in the cost of living. The new prices were made effective February 12, although announcement of them occurred in Washington on February 7.

The new price in the Lance Creek field, Niobrara County, Wyoming, is $1.25, an increase of 13 cents over the former price of $1.12 a barrel, for 40-gravity and above. For the Salt Creek

Trends of Operations and Changes in Stocks

Figures on crude stocks are from Bureau of Mines weekly reports; all others from American Petroleum Institute weekly reports, which are estimates on Bureau of Mines basis.

(All figures in thousands of barrels—add 000)

HIGHS AND LOWS OF RECENT YEARS

ITEM	Crude Oil Prod. Barrels Daily	Crude Oil Prod. Week Ended	Runs to Stills Barrels Daily	Runs to Stills Week Ended	Crude Stocks Barrels	Crude Stocks Week Ended	Gasoline Stocks Barrels	Gasoline Stocks Week Ended	Gasoil and Distillate Stocks Barrels	Gasoil and Distillate Stocks Week Ended	Residual Fuel Oil Stocks Barrels	Residual Fuel Oil Stocks Week Ended
Highs:												
1939	3,910	8- 5	3,650	10-21	278,607	5-26	87,769	4-22	39,562	10-28	116,237	8-26
1940	3,890	3-16	3,690	6-22	265,865	8-31	102,817	4-20	49,051	10-19	109,135	9-14
1941	4,337	11-22	4,120	10-18	266,187	3-29	99,727	3-29	[1]54,983	11-15	102,448	1- 4
1942	4,337	2- 7	3,961	1- 3	263,208	3-28	[1]109,281	3-14	49,861	11-14	95,857	1- 3
1943	[1]4,436	11-13	4,331	12- 4	245,752	5-29	94,159	3-20	46,187	11-27	72,881	1- 2
1944	4,409	1-29	[1]4,453	1- 1	240,992	1- 1	81,784	2- 5	42,310	1- 1	57,330	1- 1
Lows:												
1939	[2]1,601	8-26	3,125	2-18	[2]229,127	10-12	71,152	10- 7	20,722	4-15	105,397	4- 8
1940	3,335	11-30	3,370	1- 6	237,339	1-27	79,847	11- 9	23,551	4- 6	102,344	2-10
1941	3,364	1-11	3,490	1-18	240,399	11-15	79,923	10- 4	28,381	4-12	90,914	7-12
1942	3,297	7- 4	3,393	5-23	231,896	12-12	75,934	12- 5	29,240	4-25	72,962	12-26
1943	3,821	1- 9	3,579	3-13	232,191	1- 9	68,182	10-16	30,732	4- 3	57,596	12-25
1944	4,357	1- 1	4,264	1- 8	238,148	1-15	76,302	1- 1	36,153	2- 5	52,734	2- 5

TRENDS OF 1942 AND 1943

Trends in Week Ended:	Crude Oil Production Daily	Crude Oil Runs to Stills Daily	Crude Oil Stocks Week End	Gasoline Production Weekly	Gasoline Stocks Week End	Gasoil and Distillate Production Weekly	Gasoil and Distillate Stocks Week End	Residual Fuel Production Weekly	Residual Fuel Stocks Week End
1942:									
January 3	4,038	3,961	244,440	13,797	92,987	3,855	49,357	6,918	95,857
January 31	3,871	3,848	250,740	13,292	97,810	3,817	40,674	6,640	91,189
February 28	4,016	3,675	259,373	12,131	105,635	3,799	34,547	6,813	88,285
March 28	3,820	3,667	263,208	11,663	105,624	3,661	31,756	6,344	83,045
April 25	3,581	3,506	257,073	10,535	102,897	3,267	29,240	6,869	81,107
May 30	3,877	3,522	255,023	10,478	95,355	3,034	31,384	6,993	79,628
June 27	3,719	3,581	253,364	10,713	88,396	3,549	32,851	6,615	77,304
July 25	3,691	3,658	249,262	10,864	82,281	3,647	35,966	6,796	77,816
August 29	3,964	3,697	249,007	11,300	80,831	3,850	42,060	6,875	78,034
September 26	3,909	3,802	242,785	10,954	80,550	4,215	45,954	7,094	78,943
October 31	3,901	3,731	239,266	11,153	79,159	.....	48,131	.....	79,166
November 28	3,878	3,736	234,850	11,269	78,854	.....	49,739	.....	77,796
1943:									
January 2	3,871	3,734	233,938	10,957	82,420	4,285	42,913	7,683	72,881
January 30	3,826	3,698	233,863	10,339	88,830	3,888	37,057	7,452	70,763
February 27	3,873	3,709	235,217	10,566	93,157	4,230	32,939	7,839	70,140
March 27	3,896	3,742	239,126	10,231	94,079	3,541	30,980	8,018	67,938
April 24	3,913	3,737	242,035	10,583	91,001	3,954	31,142	8,168	67,455
May 29	3,970	4,679	245,752	10,656	83,937	3,798	32,274	7,672	67,682
June 26	3,955	4,015	242,657	11,092	79,589	3,876	34,044	8,126	67,960
July 31	4,133	3,788	238,420	11,127	74,977	3,765	36,363	8,478	66,877
August 28	4,196	4,227	236,170	12,420	72,525	4,351	37,928	8,732	67,250
September 25	3,344	4,156	233,013	12,206	70,024	4,608	40,328	8,560	66,659
October 30	4,383	4,176	237,219	12,813	69,297	4,642	44,591	7,968	63,838
November 27	4,414	4,261	239,761	12,638	69,980	4,379	46,187	8,633	62,143
December 25	4,363	4,185	241,310	12,597	74,024	4,457	43,791	8,689	57,596
1944:									
January 1	4,357	[1]4,453	240,992	13,192	76,302	4,575	42,310	9,141	57,330
January 29	4,409	4,359	240,251	13,427	81,085	4,054	37,266	8,889	52,857
February 5, 1944	4,400	4,334	.....	13,292	81,784	4,138	36,153	9,087	52,734
February 6, 1943	3,853	3,692	[4]233,863	10,479	89,696	4,122	35,503	7,764	71,095
Change:									
In week	—9	—35	+1,437	—135	+699	+84	—1,113	+198	—123
In year	+547	+632	+6,388	+2,813	—7,912	+16	+650	+1,323	—18,361
In year	+14.2%	+17.1%	+2.7%	+26.8%	—9.7%	+0.4%	+1.8%	+17.0%	—25.8%

[1] All time peak. [2] Lowest since April, 1922. [3] Lowest since October, 1922, due to shutdown of six Mid-Continent States. [4] Stocks, January 30, 1943.

field, Natrona County, except the Tensleep sand, a ceiling price of $1.17 was established for 36- to 36.9-gravity crude, up 5 cents from the old posting of $1.12. Crudes of lower gravities than 40 at Lance Creek and 36-36.9 at Salt Creek will have ceilings graduated downward by differential of 2 cents for each degree of gravity. Crude from the Tensleep sands was excepted from the increase because of being of a different type and already having a specific price.

Production of the Lance Creek field is over 600,000 barrels per month, and that of Salt Creek field, excluding Tensleep sands, is about 350,000 barrels monthly, OPA stated.

Earlier reports from Washington in which the above Wyoming increases were forecast also predicted increases for Falls City and Barada fields, Nebraska, from 90 cents a barrel to $1.03 for 29-29.9-gravity crude and to $1.05 for 30-30.9-gravity, by extending to the areas the established Oklahoma-Kansas gravity scale of prices, placing 40-gravity and above at $1.25 and grading lower gravities by 2-cent differential.

Slow Deliveries East

Markets in the East Coast district have been complaining about extremely low deliveries of materials by tank car, and they report critically low stocks of light fuel oils and not much improvement in gasoline inventories. Supplies of kerosine also are very limited.

A similar scarcity situation prevails on the Gulf Coast, where kerosine stocks of refiners are badly depleted, while gasoline storage is rapidly diminishing under strong demand, in spite of the fact that plants are running close to capacity.

Refiners of the Western Pennsylvania district are encountering strong demand for neutral oils and are having difficulty in meeting market requirements for virtually all products.

Principal problem in the Middle West is the continuing shortage of tank cars. Supplies of all products are tight, but some relief has been afforded by the relatively light requirements for heating oil, due to comparatively mild weather.

Transportation is a serious problem also in the Mid-Continent, where shortage of tank trucks is greatly interfering with movement of oils, a high percentage of existing trucks being laid up for repairs. While some refiners have been accumulating some gasoline in storage, their stocks are far short of those held a year ago, although demand is running much higher. Thus they foresee extreme shortages ahead. Stocks of other products likewise are extremely low in relation to current heavy demand.

U. S. Production Shows Slight Drop for Week

Declining during the week ended February 12, United States crude oil production hit a total of 4,420,128 barrels, according to figures of THE OIL WEEKLY. This is a deficit of 15,459 barrels as compared with last week's total of 4,435,587 barrels.

California slid from its all-time peak of last week to 811,250 barrels, a 11,950-barrel drop. Illinois dropped 15,300 barrels, Montana 2417 barrels, and Oklahome 1300 barrels.

The only important gains in production were reported from Kansas of 14,850 barrels, Wyoming 3300 barrels, and from Colorado, 2200 barrels.

Crude Oil Production in the United States

(Estimates compiled by The OIL WEEKLY. All figures indicate daily averages, in barrels.)

State or District	PRODUCTION IN WEEK ENDED February 12	February 5
Arkansas	78,750	78,300
California	811,250	823,200
Long Beach	30,250	30,200
Midway-Sunset	55,600	55,400
Kettleman Hills	42,400	43,000
Wilmington	100,200	101,200
Rest of State	582,800	593,400
Colorado	8,500	6,300
Illinois	202,800	218,100
Salem	25,450	25,800
Louden	31,000	35,700
Other New Pools	134,150	144,400
Old Pools	12,200	12,200
Indiana	13,300	14,000
Kansas	281,750	266,900
Kentucky	21,750	22,500
Louisiana	361,950	360,050
North	78,750	76,850
South	283,200	283,200
Michigan	51,600	52,900
Mississippi	43,900	45,800
Missouri	200	95
Montana	23,433	25,850
Nebraska	1,100	1,200
New Mexico	113,200	113,250
New York	14,000	14,500
Ohio	8,800	9,300
Oklahoma	327,200	328,500
Oklahoma City	47,700	48,200
Seminole Area	70,600	71,250
Rest of State	208,900	209,050
Pennsylvania	40,400	41,200
Tennessee	30	30
Texas	1,909,500	1,909,950
Upper Gulf Coast	516,500	516,550
East Texas Field	390,500	390,550
Rest of Eastern Texas	110,350	110,300
Lower Gulf Coast	193,000	193,300
Southwest Texas	75,300	75,300
South Central Texas	19,900	20,000
West Texas	362,000	362,050
North Texas	140,000	140,000
Panhandle	101,950	101,900
Utah	15	12
West Virginia	8,350	8,600
Wyoming	98,350	95,050
Total United States	4,420,128	4,435,587

Texas Commission Sets Proration Hearings

A hearing has been scheduled by the Railroad Commission for February 18 for revision of the gas-oil ratio rule for the Goebel field in Live Oak County.

The commission has postponed until February 23 its hearing on the Lopeno field in Zapata County. This is a gas field and operators are attempting to work out some proration program that will enable them to share a market for gas from the field.

The commission has postponed until March 22 its hearing on the Wasson field, Gaines and Yoakum Counties. The field has a gas-oil ratio allowance of 10,000-1, but operating conditions indicate that this can be reduced materially.

At a hearing February 15 the Commission will consider operating rules for the new Weil field in Jim Hogg County, which was discovered by Sun Oil Company.

Sun Oil Company has another hearing scheduled for February 15 for operating rules for the new Canales field in Jim Wells and Kleberg Counties.

No unusual developments are anticipated at the statewide hearing scheduled by the Texas Railroad Commission for February 17. Late last week the PAW recommendations for March had not arrived in Austin, but there was no reason to expect any material difference in the amount of oil that would be required from Texas wells.

Shell Pipe Line Corporation Changes Are Announced

Following the recent retirement of C. C. Ingram as superintendent of the Mid-Continent area for Shell Pipe Line Corporation, several changes in personnel have been made. L. F. Young succeeds Ingram, with headquarters in Cushing, Oklahoma.

C. D. Winkelman, who has been system superintendent for the Bayou Pipe Line, succeeds Young as superintendent for the Texas Gulf area which has been expanded to include the previously separated Bayou Pipe Line.

In the Mid-Continent area organization, which has jurisdiction over Shell Pipe Line's operations in Kansas, Oklahoma, Missouri and Illinois, G. G. Billings becomes assistant area superintendent, taking the position heretofore held by W. N. LeSeuer, who becomes general maintenance superintendent. E. A. Dierdorff, who has been area engineer, is promoted to the head office organization, and is succeeded by C. E. Dolhonde, who has been project engineer during the construction of the Bayou System. W. H. Craddock, who has been superintendent of the Louisiana Division, Bayou System, becomes superintendent of the Healdton Division, which covers operations in the southern half of Oklahoma. W. B. Sanders, superintendent of the Cushing-Wood River Division, will continue to directly supervise line and station operations and maintenance east of Verdi Station and west of the Mississippi River. I. C. Murphy becomes foreman of the Cushing District, directly supervising activities from Cushing Tank Farm to and including Verdi Station. G. H. van Horne continues as district foreman at Wood River.

In the Bayou Pipe Line organization S. B. Bean becomes operating superintendent, headquarters at Port Neches, and will directly supervise line and station operations and maintenance between the Trinity and Calcasieu rivers. C. P. Wilson is promoted to foreman of the Baytown District, which includes the Houston-Texas City feeder lines and the trunk line west of Trinity River. H. E. White is promoted to foreman of the Opelousas District, which includes the trunk line and stations east of the Calcasieu River.

Gulf Publishing Company Opens Cleveland Office

On February 15 The Gulf Publishing Company, publishers of THE OIL WEEKLY, PETROLEUM REFINER, THE COMPOSITE CATALOG and THE REFINERY CATALOG, will open offices at 1010 Euclid Avenue (Swetland Building), Cleveland. The offices will be in charge of Charles Haskins, who came to the company from Printer's Ink on January 1.

A sub-office will be retained in the Law and Finance Building, Pittsburgh, the Cleveland Office having general jurisdiction over Western Pennsylvania, much of Ohio, all of West Virginia and the extreme western portion of New York State.

PAW Materials Group To Meet February 28-29

Frank Watts, PAW director of materials, has called a meeting at Washington February 28-29, of the chairmen of all subcommittees of materials. This meeting will also be attended by the district directors of material.

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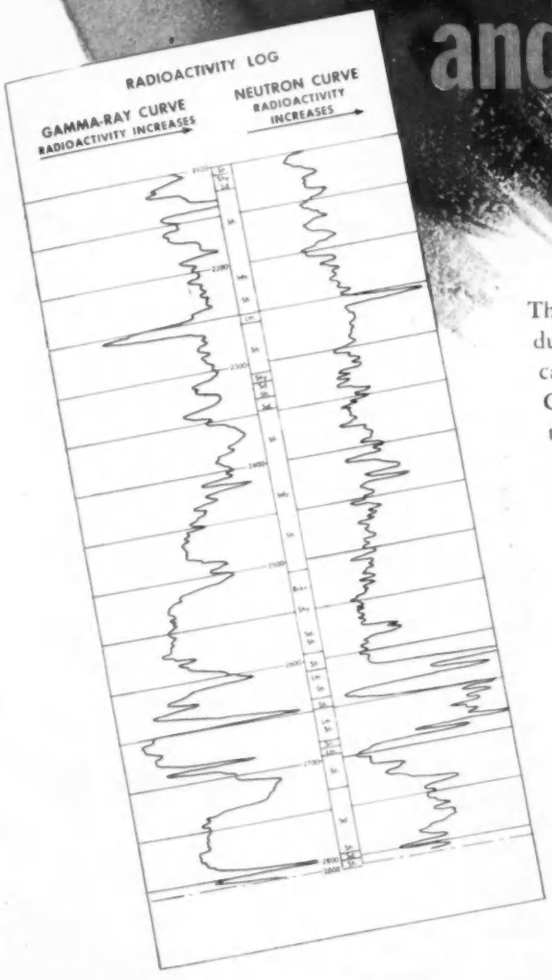

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January Completions Show Gain Over Last Year; 3000 Rigs Now in Operation

In line with the indicated material expansion of drilling this year, January brought a relatively high rate of well completions, and at the beginning of February there were almost 3000 drilling rigs in active operation, a comparatively large number.

As compared with January a year ago, weekly average well completions showed an increase of 7.4 percent in the initial month of 1944.

Early months of the year customarily show fewer completions than succeeding months, due in considerable part to adverse weather conditions, and this trend explains the fact that completions of January this year were down as compared with December and November of last year. Similarly, it is to be expected that completions will continue seasonally curtailed in February, although materially above those of February a year ago. While rigs in operation February 1 were fewer than those one month previously, they exceeded the corresponding total a year before by 37 percent. Last year, completions declined not only in February but also further in March, before entering upon the gradual expansion which occurred as the year progressed. This year, such continuing decline in February and March appears less likely.

The 1855 completions of January, 1944, represented an average of 371 per week (for the 5 weeks ended January 29), compared with 442 weekly in December, 434 in November, 386 in October, 378 in September. While seasonally down, the January average materially exceeded that of any month in the first half of 1943.

All states showed seasonal decreases in completions in January, but there were only minor declines in some states and districts, including Indiana, Kansas, South Louisiana, New Mexico, West Texas, and the Texas Gulf Coast, in reflection of strong demand for crude in those areas.

While the nation as a whole showed 7.4 percent higher rate of completions in January, 1944, than in January, 1943, changes from a year ago varied widely for different states and districts. Texas accounted for 13 percent more completions per week in January than a year before, despite decreases in the Panhandle, Southwest Texas, and South Central Texas, as sharp gains were recorded in East Texas, West Texas, and the Gulf Coast, while there were smaller increases in North and West Central Texas. California showed an increase of nearly 30 percent, Kansas 20 percent, Michigan 40 percent, Kentucky 82 percent, New Mexico 33 percent, Mississipppi 166 percent, Wyoming 60 percent, and lesser gains were recorded for Illinois, Indiana, West Virginia. In contrast, the January rate of weekly completions was lower this year than last year in Arkansas, Oklahoma, North Louisiana, South Louisiana, Colorado, Montana, New York, Pennsylvania.

The total number of wells drilling or rigging up on February 1 was 2992, down 5 percent from a month before but up 37 percent from one year previously. Against the general trend from a month before, operations were up or unchanged on February 1 in California, Illinois, Indiana, North Texas. Noteworthy increases in active operations compared with a year ago included those in California, Kansas, Kentucky, Michigan, Mississippi, Montana, New Mexico, Oklahoma, Eastern Texas, North and West Central Texas, West Texas and the Texas Gulf Coast, although gains were recorded also for some other states and districts. Against the trend were substantial declines from a year ago in Illinois and Nebraska and small decreases in Arkansas, Indiana, North Louisiana and South Louisiana.

U. S. Well Completions in January, by States

(Figures compiled from weekly reports of editorial staff men, with the following exceptions: Arkansas data from Arkansas Oil & Gas Commission; Missouri from Missouri Geological Survey; Allegany, New York, Bradford and Kane-Clarendon, Pennsylvania, from The Producer's Monthly; Tennessee from Tennessee Division of Geology.)

	MONTHLY COMPLETIONS: January, 1944										RIGS IN OPERATION					
	Details for January, 1944					Total Completions			Percent Change from Year Ago, in Weekly Average	Total Footage January, 1944	Details for February 1, 1944			Total: Drilling and Rigging Up		
	New Wells				Old Wells Deepened	Jan., 1944[1]	Dec., 1943[3]	Jan., 1943[2]			Drilling	Rigs Up	Shut Down	Feb. 1, 1944	Jan. 1, 1944	Feb. 1, 1943
State or District	Oil*	Gas	Dry	Others[4]												
Alabama	...	...	...	...	...	.....	.....	.....	.....	.....	2	...	...	2	4	1
Arizona	...	...	...	...	...	.....	.....	.....	.....	.....	3	...	3	3	3	...
Arkansas	7	...	5	...	...	12	21	14	— 31.4	60,350	23	3	...	26	35	29
California	114	3	25	...	3	145	131	90	+ 28.9	535,959	285	55	25	340	340	159
Colorado	1	...	1	...	...	2	10	3	— 46.7	8,315	6	1	8	7	13	6
Florida	...	...	...	...	...	.....	.....	.....	.....	.....	1	...	...	1	3	...
Georgia	...	...	...	...	...	.....	.....	.....	.....	.....	...	...	...	...	1	...
Illinois	106	...	78	3	...	187	203	144	+ 3.9	481,422	159	28	17	187	178	221
Indiana	15	2	12	...	...	29	23	22	+ 5.5	51,571	38	9	2	47	39	49
Iowa	...	...	...	...	...	.....	.....	.....	.....	.....	...	...	2	...	...	2
Kansas	81	5	87	3	6	182	150	121	+ 20.3	589,652	230	11	21	241	255	165
Kentucky	17	...	24	...	...	41	39	18	+ 82.2	65,444	55	12	3	67	70	44
Louisiana	23	4	16	...	...	43	61	42	— 18.1	379,841	88	9	38	97	109	103
North	2	3	5	...	...	10	33	10	— 20.0	54,087	31	3	28	34	39	36
South	21	1	11	...	...	33	28	32	— 17.5	325,754	57	6	10	63	70	67
Michigan	25	...	29	...	...	54	59	31	+ 39.4	151,544	66	16	27	82	96	49
Mississippi	2	...	8	...	...	10	11	3	+166.6	49,924	13	1	2	14	16	9
Missouri	...	...	2	...	...	2	2	1	+ 60.0	1,030	6	...	...	6	6	3
Montana	20	1	5	...	...	26	34	12	— 73.3	65,226	55	11	16	66	67	28
Nebraska	1	...	5	...	...	6	2	1	+233.0	15,693	1	...	1	1	5	14
New Mexico	18	3	14	...	...	35	26	21	+ 33.3	106,929	83	5	16	88	91	43
New York	58	...	2	37	...	97	99	107	— 20.0	135,466	89	10	21	99	96	102
North Dakota	...	...	...	...	...	.....	.....	.....	.....	.....	...	...	2	...	1	...
Ohio	16	49	39	2	...	106	30	78	+ 8.7	250,160	159	22	39	181	180	165
Oklahoma	67	12	46	5	3	133	124	110	— 1.5	447,037	345	27	2	372	382	215
Pennsylvania	91	19	15	86	...	211	186	190	— 11.2	389,014	202	36	48	238	207	218
South Dakota	...	...	...	...	...	.....	.....	.....	.....	.....	1	...	1	1	2	1
Tennessee	...	...	1	...	...	1	...	1	— 20.0	2,005	2	1	1	3	5	2
Texas	218	13	184	2	10	427	457	302	+ 13.1	858,657	692	50	121	742	833	494
East Texas Border	...	...	...	...	...	.....	.....	.....	.....	.....	7	1	1	8	8	9
Rest of E. Texas	9	...	16	...	...	25	27	12	+ 66.6	158,543	41	3	14	44	55	24
North Texas	39	...	46	2	2	89	128	67	+ 6.3	253,300	123	8	22	131	121	72
West Central	7	1	24	...	...	32	40	22	+ 16.4	72,283	40	6	20	46	55	29
West Texas	82	...	23	...	7	112	99	64	+ 40.0	459,091	297	9	28	306	330	183
Panhandle	11	1	2	...	...	14	22	25	— 55.2	46,119	34	5	13	39	43	35
Upper Coast	18	1	18	...	1	38	35	21	+ 44.8	278,062	54	5	5	59	85	43
Lower Coast	37	9	31	...	...	77	62	47	+ 31.1	445,722	66	7	10	73	96	63
Southwest	14	1	21	...	...	36	35	39	— 26.2	131,946	23	4	5	27	32	25
South Central	1	...	3	...	...	4	9	5	— 36.0	13,591	7	2	3	9	8	11
Utah	...	...	...	...	...	.....	.....	.....	.....	.....	1	...	2	1	3	2
West Virginia	8	72	12	...	...	92	87	64	+ 15.0	237,963	30	4	7	34	56	24
Wyoming	12	...	2	...	...	14	15	7	+ 60.0	66,667	44	2	10	46	52	25
Total United States	900	183	612	138	22	1,855	1,770	1,382	+ 7.4	5,949,874	2,679	313	435	2,992	3,148	2,173

* Includes distillate wells. [1] Wells completed in 5 weeks, or 35 days, ended January 29, 1944. [2] Wells completed in 4 weeks, or 28 days, ended January 23, 1943. [3] Wells completed in 4 weeks, or 28 days, ended December 25, 1943. [4] Water input, gas injection, and salt water disposal wells

International Developments

Mexican Court Rejects Plea by Shell

Only Mexican individuals or groups are entitled to own and develop Mexico's petroleum riches, it has been decided by the supreme court of Mexico in repulsing an attempt by Royal Dutch Shell enterprises, headed by the Eagle Oil Company, to recover rights for the exploration and exploitation of hydrocarbons.

Pointing out that such privileges were legally acquired before promulgation of the Constitution of 1917, the company maintained that they should therefore be exempt from decrees issued in 1939, 1940 and 1941, limiting exploitation of petroleum reserves to Mexican nationals. In rejecting this claim, Magistrate Manuel Bartlet held that the company had failed to show any concrete case where its guarantees had been violated.

Chile Is Financing Petroleum Explorations

The government of Chile has taken active steps to accomplish the discovery of oil in commercial quantities in that country, especially in the southern region, where fairly large structural basins, with coal beds and thick sediments, indicate favorable prospects. It is authoritatively said that four geological-geophysical field parties are at work in the Territory of Magallanes, under government contract and that they are employed by a Russian firm that was successful in negotiating the contract assignment, notwithstanding the efforts of at least one American company to get the job.

Natural Gas Industry Is Reported in Hungary

Discovery of large natural gas resources in Hungary, location of the field or fields not revealed, has been announced by the German press. Utilization of the gas for industrial and household use has been in progress for some time though the operations of a new company: Siebenburgische Erdgas AG, which apparently means that the gas is being piped to seven cities. It is also understood that a butane-propane by-product of refineries and gas extraction plants is now available in Hungary for use as motor fuel, and that private car owners are being encouraged to use it to the fullest extent.

Alberta Field Sands Not Uniform, Core Tests Show

Estimates of the oil content and commercially exploitable area of the Athabaska tar sand deposit in Alberta are being revised downward as a result of core tests being carried on by the Canadian government.

A representative stated that the richest sand section appears to be more or less restricted to the vicinity of the Abasand Company development on Horse River, at Fort McMurray, where the sand is coarse, free from clay and silt, and carries up to 60 percent of bitumen.

Cores recovered in the same general vicinity, and in other supposedly favorable locations, show that the character and content of the McMurray freshwater sandstone formation are neither uniform or predictable. On Wheeler Island the formation was found to be high in minus 200-mesh sand, with considerable amounts of clay present. It is doubtful whether either the Abasand separation process or processes now being tested would make possible commercially feasible recovery of the hydrocarbon content from the sand in that area.

The Steep Bank area also has been drilled and found to hold extremely low reserves. Much of the sand section there has been thoroughly leached by moving ground water, and only a few feet of rich sand remains. The formation is composed of alternating beds of saturated, leached, and low-porosity sands, and 3- to 4-foot beds of clay.

As more work is done in drilling and studying the tar-sand deposits, it becomes more and more evident that not very much is known about them yet. Neither has an assured economically profitable process been perfected for extracting the heavy oil.

The extraction plant being constructed by the government at the Abasand site is scheduled for completion before June of 1944, and may include a refining unit that will yield products ranging from asphalt to gasoline. Actually, though, the 600-barrel plant is no more than a test project, to determine whether or not the tar sands can be handled and processed successfully on a commercial scale.

Extensive Developments Under Way in Ecuador

Several American-financed oil companies are reported to have taken over some of the "study concessions" that were being explored by Japanese and German geologists as late as 1942, along the coastal region of Ecuador, in the states of Guayas and Manabi. Concession contracts have been negotiated with the government of Ecuador, requiring the drilling of a number of test wells. It is understood that some offshore locations will soon be drilled, where submarine seepages indicate favorable prospects for commercial production from lower Tertiary strata.

Undeveloped Soviet Oil Field Gets Rail Line

The Soviet government has completed construction of a new rail line, extending more than 1000 miles northeast from Kotlas, all the way to Vorkuta, on the Paikhoi Peninsula, near the Arctic shoreline. The new railroad is the first to tap the rich mineral region on the western slopes of the northernmost Urals, and was constructed chiefly to make possible the immediate exploitation of the known but undeveloped oil reserves of the Pechora Basin, and the coal beds of the Vorkuta region farther north. The most promising oil resources are reported to be in the vicinity of Ukhta, along the southwestern rim of the structural basin lying between the Ural Mountains and the Timan Hills.

Second Gaspe Well to Be Spudded Immediately

All machinery has been delivered at the drilling site where Continental Petroleums, Ltd. will put down its C. P. L. No. 2, 8 miles west of No. 1 well, on the Gaspe Peninsula, projecting into the Gulf of St. Lawrence. No. 1 is reported to have made 536 feet of hole in November, carrying the footage down to 2124, all in Lower Paleozoic section. December footage and planned total depth have not been announced. Near surface oil shows, with strong gas flow, were encountered in the first well at 33 feet, in sandy Devonian shale.

More Rail Lines to Aid Development in Colombia

Plans have been completed for the immediate construction of 75 miles of railroad line from Armenia to Ibaque, through the central Andean range of Colombia, giving the capital city of Bogota its first rail connection with either the Pacific or Caribbean coasts. The new line will provide a nearly direct route between Bogota and the Pacific port of Buenaventura, speeding up freight and passenger service to the interior valleys and the Llanos region. In addition, approval has been granted by the national congress for extending the line of the Ferrocarril Central del Norte, from Bucaramanga to Barbosa, in the northeastern oil field region, close to the Venezuelan border.

Oil Fields in Rumania Being Rapidly Depleted

Trade reports received by the United States Department of Commerce indicate that the extreme forcing of wells in the Rumanian oil fields has greatly steepened the curve of declining production for most of the producing areas in the country. As a result the 1943 production of Rumania was considerably less than the 48,465,000 barrels which were produced there in 1942. It is believed that 1943 yields will total no more than 40,000,000 barrels.

Western Alberta Survey By Photography Planned

A group of companies led by Shell Oil Company and Imperial Oil Company have completed plans for making a photographic survey of the foothills belt of Western Alberta, with the project scheduled to be completed before the end of the coming summer. The work is expected to cost approximately $75,000, and will cover an area of more than 15,000 square miles, from the Montana border northward.

As a result of the photographic survey the participating companies expect to gain valuable information on the bedrock structure of the area and the exact location of possible structures that are not as readily recognizable by surface surveys.

U. S. Field Operations

Illinois

New McClosky Pool Indicated in Jefferson

The Texas Company apparently has opened a new pool in Jefferson County, 1½ miles southwest of production in the Divide pool, at Greene 1, C s½ SE SE 15-1s-3e. The well swabbed 50 barrels of oil in 24 hours from McClosky lime after 1000 gallons of acid and was scheduled for another acid treatment. Shows of oil also were encountered in the Aux Vases and Rosiclare formations.

Coles County: A new pool is in prospect at C. A. Beckman's Hermans Community 1, NE SW SW 25-12n-7e, just south of Mattoon in an area long considered favorable but dotted with dry holes and only two small producers. Pipe was set at 1994 feet to test at 2004 to 2010 feet in Aux Vases sand, where 4 feet of good saturation was recovered in a core. The well probably will be given a shot after plug is drilled.

Wayne County: Robinson & Puckett's Felix 1, SE NE SE 12-3s-7e, a new Aux Vases sand pool opener 1½ miles north of production in the Mill Shoals pool, has been placed on pump after swabbing approximately 170 barrels daily from 3240 feet. Total depth of the hole is 3261 feet. The operators' Felix 2, NW NE SE 12-3s-7e, is drilling near pay.

Madison County: Obering and associates' Becker-Pence 2, 9-4n-6w, in the northern part of the Marine pool, may be drilled deeper in an effort to increase Devonian lime production which is now approximately 235 barrels daily by flow. Present production is from two feet of pay. The well is proving the northward trend of the pool. Becker-Pence 1 flowed 290 barrels of oil in preliminary tests from 1688-93 feet.

White County: Gulf Refining Company's Parsons 1, SW SW SW 7-4s-14w, near Crossville in wildcat territory, swabbed 6 barrels of oil and 10 barrels of water through casing during a 7-hour test of Benoist sand. A shot was scheduled for the well, which also had shows in the Biehl and Clore sands. Total depth of hole is 2826 feet.

Oklahoma

Operations Slow, Wildcat Tests Are Indefinite

Gulf Oil Corporation is resuming operations at Perkins 1, C SE SW 31-8n-17w, just north of the Gotebo area of scattered production. Location is in Washita County, and on an undefined subsurface feature that is known to trend in this direction. The well was started early in 1943, drilled to 4714 feet and shut down. While the status of the test has been indefinite, the shutdown has been attributed to the finding of unexpected geological conditions at the well necessitating additional study of survey information upon which the location of the test was made.

Oklahoma County: West Edmond field continues to pace the state in activity with 10 locations announced. Early in the month some of the wells were ordered closed due to overage in production but this has been smoothed out and operations are in full swing.

A. R. Jordan et al's Bourne 1-A, SW SE NE 14-14-1w, a tight well, seven miles from the Northeast Edmond play, is reported showing slight saturation in Wilcox at 5893-5 feet. No test has been made although operators had prepared to make a swabbing test of the show.

McClain County: The two Carter Oil Company deep tests west of the Ridge are still drilling without encouraging shows. Cottingham 1, C SE SW 4-7n-3w, is below 10,880 feet, drilling in broken green shale which is unidentified. Operators originally believed the Second Wilcox sand was drilled but the inability to identify the section now being drilled casts some doubt upon earlier identifications. Johnson Ranch 1, C SW NE 13-8n-4w, which obtained mediocre shows in Viola lime, is drilling below 10,250 feet in Simpson Dense.

Kansas

Two Wildcats Showing, New Field in Prospect

The Texas Company has opened a new Arbuckle lime field at Harper 1, C NW NW 10-18-14w, northwest of Great Bend, slightly southwest of the general trend of development. The well found Arbuckle at 3429 feet and ran pipe to that depth. Hole was cleaned out to 3435 feet and 2000 feet of oil rose in the hole in 3 hours. An additional foot of hole was then made in an attempt to increase the flow, but apparently no additional oil was obtained. Operator is preparing to test.

Barton County: Mineral Products Company's Refi 1, NW NW SW 30-16-12w, picked up a good show at 3402 feet in Arbuckle lime and ran pipe to 3400 feet; total depth 3403 feet. The show was not tested, and operator is awaiting for cement to set.

Pratt County: One of the state's most important 1943 discoveries, Chitwood field, has been given another pay horizon at Lion Oil Refining Company's Chitwood 4, NE NW NW 23-28-12w, which is now producing from Arbuckle lime. The well found the lime at 4452 feet and drilled an additional 8 feet. After acidizing, it began flowing 18 barrels hourly.

Rooks County: Champlin Refining Company's Marcotte 1, SE NE SW 15-10-20w, recent pool opener, has been awarded an official state potential of 2711 barrels daily after a long series of tests. The well produces from Arbuckle lime at 3764 feet.

Wallace County: A location has been made 50 miles from nearest production in Western Kansas at Sinclair Prairie Oil Company's Glad and Brock 1, SE NW NE 19-13-42w. Structures here are only relatively related to the Uplift feature. Possible pay horizons are Kansas City-Lansing, Simpson sands, Mississippi lime, Arbuckle and Basal sands.

West Texas

Pecos County Discovery To Squeeze and Deepen

Standard Oil Company of Texas' Mac-Der Company 1, Pecos County discovery in Ellenburger, is scheduled to squeeze perforations and deepen after preliminary tests yielded in excess of 4,000,000 feet of gas and 100 barrels of oil and basic sediment daily. Production was from perforations at 4723-28 feet in Ellenburger, topped at 4706 feet with elevation of 2643 feet. The high-pressure gas may have prevented an effective cement job in landing pipe on bottom at 4730 feet. Unusually high prices were paid for leases and royalty when the wildcat showed production through tester, and three tests have been assigned the area.

Phillips Petroleum Company's Price 1, southern Pecos County wildcat and the deepest test in the district, installed heavier rotary, and was drilling at 13,055 feet with the Ellenburger as its objective.

Winkler County: Sun Oil Company's Walton 3, SEc PSL 8, Block B-3, Colby sand sector of the Keystone field, has indicated a 2½-mile southwest extension for the 4900-foot Holt lime pay in yielding 240 feet of oil- and gas-cut mud on drill-stem test at 4951-89 feet. Additional pay was logged in deepening to 5029 feet, where operations were halted to run electric log. Sid Richardson and Perry Bass' Walton 3, west offset to their Holt pay discovery, recorded the second completion in flowing 184 barrels of 38.4-gravity oil initial through 24/64-inch, with gas-oil ratio of 925/1. Production is from perforations at 4716-24 feet following 2-stage treatment with 1050 gallons of acid. Perforations were squeezed 3 times before attaining balanced gas-oil ratio, and it was found inadvisable to use a large volume of acid. Gulf Oil Corporation's Keystone 12 developed collapsed casing after perforating at 4844-50 and 4814-31 feet to complete in the Holt after passing up a heavy flow of gas at 4677-4707 feet.

Kermit-Ellenburger: Magnolia Petroleum Company's Walton-State 21, ¾-mile southeast of its discovery, flowed 151 barrels 43-gravity oil and 20 barrels of salty-sulphur water the first 24 hours, then gauged 330 barrels of 40.5-gravity oil, including 7 percent mud and water, in 23 hours through ¼-inch, gas-oil ratio averaging 1309/1. Production is from perforations at 10,669-10,679 feet in Ellenburger, topped at 10,581 feet, or 136 feet low. The water is not believed to be coming from the Ellenburger as the well was halted about 10 feet above the projected water table, but perforations will be made at a higher level. Rig has been skidded to Walton-State 22-E, ½-mile west of the discovery. The company's Walton 234, northwest outpost, was drilling 9540 feet.

Prospects: Sohio Petroleum Company's Shannon 1, Crockett County, rated above 500 barrels daily on preliminary flow test after using acid in the main pay at 2190-2218 feet. Top of

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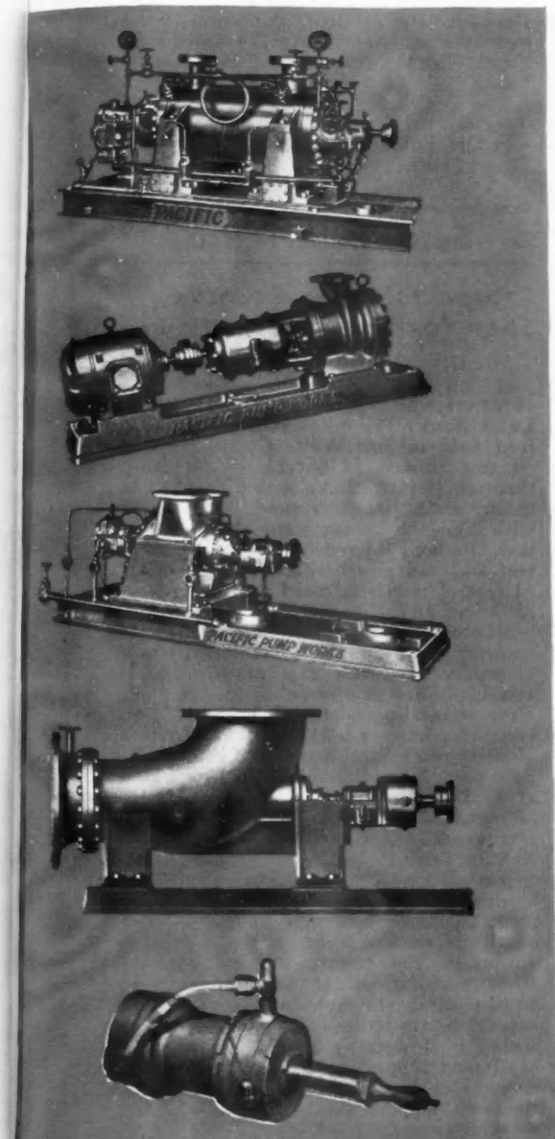

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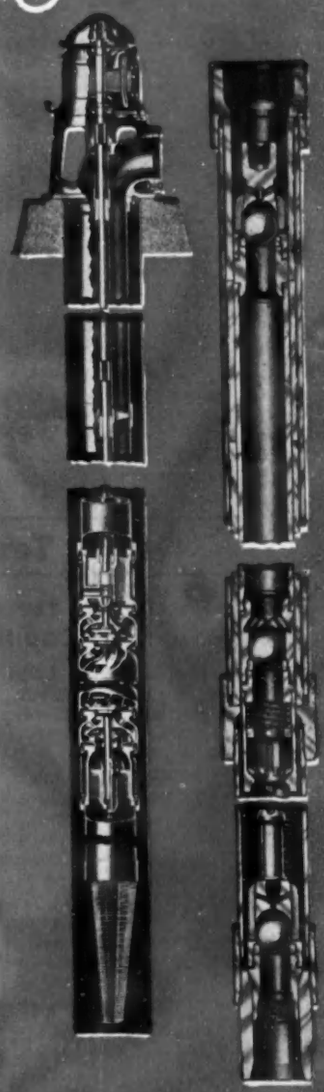

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lime was called at 2005 feet with elevation of 2520 feet, and first oil pay logged at 2060 feet. It is 1½ miles northwest of the Shannon one-well pool, which produces from a lower level in the Grayburg series. In Crane County, John I. Moore et al's Barnsley 1, 2⅜ miles east of the south end of the Sand Hills field, swabbed 3 barrels of oil hourly after re-acidizing with 4000 gallons at 4483-4651 feet. It has been in process of completion for several months. Seaboard Oil Company's Spraberry 1, Dawson County, was testing through perforations at 6820-45 feet after landing liner in sidetracked hole on bottom at 7625 feet. Several promising oil zones are to be tested.

Extension: Woodley Petroleum Company's Farmer-Honolulu 1, 2 miles north of the Yoakum County sector of the Wasson field, pumped 134 barrels initial after acidizing San Andres saturation at 5270-5315 feet, having plugged back from water at 5331-40 feet.

Failures: Shamrock Oil & Gas Company's Ellwood-Gulf 1, tested sulphur water in Ellenburger at 7960-8125 feet. In Schleicher County, Phillips Petroleum Company's Callan 1 quit in granite at 6065 feet, having logged a comparatively thin body of Ellenburger, which was followed by Cambrian sand. Humble Oil & Refining Company's Sawyer Cattle Company 2-B, Irion County, yielded an abundance of sulphur water on drill-stem test at 9331-9501 feet in Ellenburger, topped at 8960 feet.

Projects: N. G. Penrose, Inc. has contracted to drill Moore 1, C NW NW D&W 82, Block T, Terry County, and within a large block held by Gulf Oil Corporation, which is supporting the 6500-foot test. In Dickens County, Seaboard Oil Company awarded contract for the drilling of Pitchfork 1, C NE NW Section 93, Indianola Railway Survey. The initial try for Ordovician production within the Howard-Glasscock County oil district involves Continental Oil Company et al's Settles 1-D, NE SW NW W&NW 133, Block 29, Howard County, providing for 11,000-foot depth.

North Texas

Contracts Let for Four More Cooke County Tests

Contracts have been awarded by Northern Ordnance, Inc., for the immediate drilling of four nearby tests to its eastern Cooke County wildcat strike, and Seitz-Comegys & Seitz, Inc., will drill Kellenberger 1 as a northwest offset. This activity was authorized when Northern Ordnance's Foy Davis 1, Guadalupe de los Santos Survey, flowed 15 to 20 barrels of 29-gravity oil hourly from Winger sand of the Basal Strawn series at 4349-57 feet. Tankage is being installed for official gauge. All available acreage along the north flank of the Ellenburger high that is responsible for this discovery has been acquired since Davis 1 showed for a producer.

Eight tests have been tentatively scheduled for the Cosefield area opened earlier this month in northern Cooke County by Sinclair Prairie Oil Company's Montgomery 1, which flowed 1212 barrels of 40.8-gravity initial through 1½-inch choke from Strawn sand at 5112-37 feet. The discoverer has rigged up for Cory 1, northwest offset, and four more tests are slated for the discovery block. The Texas Company will drill a west offset, and Magnolia Petroleum Company proposes two tests.

Clay County: Continental Oil Company and W. B. Omohundro's Stephens 1-A, west offset to their prolific Mississippian discovery for the Stephens pool, entered Mississippi at 6122 feet, being 93 feet low, and abandoned in water at 6240 feet. Premier Oil Refining Company and Joe A. Humphrey's Wines 1, wildcat, recorded low structural position in entering Bend at 5710 feet and Barnett shale at 6135 feet, and abandoned at 6330 feet in shale. Rogers Lacy and L. S. Flannery's Lyles 1, wildcat, failed to produce after using acid through perforations at 6183-95 feet in Mississippian, topped at 6163 feet, and will be plugged back to test Bend saturation.

Montague County: C. H. Murdick et al's Walthall 1 expanded the Hildreth field 2700 feet west by south in flowing oil by heads while cleaning out after perforating three oil zones. This outpost entered Bend at 6087 feet, according to electric log, and the best pay zone is from overlying conglomerate at 6066-82 feet.

East Texas

Third Oil Level Shown in Franklin County Field

The New Hope field, Franklin County, recorded its third oil level when Tide Water Associated Oil Company and Seaboard Oil Company's Campbell 1, northeast offset to their dually-completed discovery, flowed 75 to 100 barrels of 45-gravity oil daily on preliminary test from perforations in Travis Peak sand saturation at 8186-98 feet. This test passed up temporarily the regular pays in the 7200- and 7800-foot zones in exploring the Travis Peak to 8707 feet, then was plugged back to 8440 feet because of flowing salt water.

Smith County: Arkansas Fuel Oil Company's Marsh 1, southeast outpost for the Sand Flat prospect, passed up oil saturation in Paluxy at 7095-7124 feet, and was drilling at 7350 feet. It may drill to the basal Trinity series before running pipe. Skelly Oil Company's Chisum 1, which has been testing the Rodessa for some weeks, developed fishing job when drill pipe collapsed while testing Rodessa perforations at 9265-9307 feet. This zone previously yielded a 75- to 100-barrel daily oil flow after acid. Sun Oil Company's Patterson 1, west outpost, was drilling at 7750 feet in Glen Rose, topped at 7541 feet, or about 80 feet low to Chisum 1.

Phillips Petroleum Company's McMinn 1, wildcat, 6 miles south of Tyler, was drilling at 8550 feet with a small volume of free oil showing in rotary returns from saturation passed up in first Glen Rose at 7972-8000 feet.

Wood County: Gulf Oil Corporation's Brewer 1, Winnsboro prospect, drilling dry and hard sand 8680 feet. Near Yantis, Magnolia Petroleum Company's Lindley 1 drilling 7130 feet in Glen Rose, topped at 6575 feet with elevation of 442 feet.

Manziel Field: Magnolia Petroleum Company et al's Howle-Scoggin 1 assured a minor extension for the southwest sector in logging oil sand at 6280-6300 and 6312-32 feet in Paluxy, topped at 6260 feet. Pipe was cemented on bottom to complete through perforations, and rig was moved south to drill in the northwest corner of the Herring 80¾-acre tract. This area will experience a steady gain in drilling activity until production is defined.

Smackover Projects: Barnsdall Oil Company's Heilborn 1, Bowie County, failed to make a commercial producer in showing low-gravity black oil and water from perforations at 7708-16 feet in Smackover, topped at 7690 feet. Additional perforations have been made at 7702-09 feet. In Franklin County, Humble Oil & Refining Company's Hague 1 drilling sandy-shale 10,065 feet. A. G. Hill et al's Anderson 1, Robertson County, drilling hard sandy-shale 9630 feet in Cotton Valley, topped at 8700 feet.

Texas Permits

Permits to drill 102 new wells in Texas were approved by the Texas Railroad Commission last week. West Texas led the list with 38 permits, there were 18 in Southwest Texas, 17 in North Texas, and 10 in East Central Texas.

The Gulf Coast reported 7 locations, there were 7 from West Central Texas, 4 in the Panhandle, and 1 in the East Texas field.

Southwest Texas

Prospects of Big Reserve Seen for Brooks County

Humble Oil & Refining Company may rework its discovery Brownlee 1, (formerly San Antonio Joint Stock Land Bank) 1½ miles southeast of Alfred field in Jim Wells County, which on test flowed 54 barrels of oil daily through ⅛-inch choke with 1200 pounds tubing pressure. Bottomed at 5373 feet with 5½-inch casing cemented at 4985 feet, the well logged oil sand at 4948-54 feet and had gas-distillate sand at 3202-13 feet. The Alfred field produces from 3300 feet and 4700 feet.

Nueces County: Sun Oil Company is making a second test in Rewalt Estate 1, wildcat 3 miles east of Robstown, and 1½ miles southwest of Violet field, after squeezing perforations at 5775-80 feet. The hole is bottomed at 7403 feet after logging salt water sand at 7322-7400 feet. A sand showing oil was found at 5752-80 feet, another show at 6030-32 feet, and salt water sand at 6038 feet. Operators set 5½-inch casing to 5830 feet for testing.

Jim Hogg County: Standard Oil Company of Texas is still testing Canales 1, discovery of new field 3½ miles southeast of Crestonio in the northeast corner of the county. After swabbing from perforations at 5101-11 feet in Pettus sand, the hole was shut in for several hours to build up pressure after which it flowed by heads. The Pettus sand was topped at 5096 feet, 5½-inch casing set to 5236 feet. It is believed the well will be established as a commercial producer.

Live Oak County: Humble Oil & Refining Company is drilling in hard sand and shale after testing an oil show in the 3600-foot horizon in Pace 1, wildcat 1 mile southwest of Mikeska and 8½ miles northwest of Mount Lucas gas

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field. No details have been announced concerning tests.

Wildcats: Baldridge, King & Nichols of McAllen are preparing to drill Rodriguez 2 in Edgerton area of Starr County, 3 miles south of Lockhart field on a 570-acre lease in shares 56, 63, and 64 of J. A. de la Garza Falcon porcion 80. It is 1600 feet southwest of their Edgerton 1 which pumped oil and salt water at 1222-26 feet, later abandoned.

Sun Oil Company will drill Cage 5, wildcat 3 miles northeast of Scott & Hopper field discovery and 14 miles southwest of Falfurrias. This well is on the Frio sand strike trend, which has proven prolific at Seeligson in Jim Wells County and in Starr County.

Texas Gulf Coast

Colorado County Has Interesting Wildcat

A wildcat discovery of interest is Jack Frazier and Cities Service Oil Company's Gay 1 in James Tumlinson league 3 miles northwest of Columbus, Colorado County, which flowed some oil and salt water on a drill-stem test. Perforations were made at 7664-68 feet and a drill-stem test flowed 140 barrels of fluid per day, 111 barrels being oil and 29 barrels salt water, tubing pressure mounting to 1900 pounds. The well also flowed a large amount of gas, using various size chokes. Perforations have been squeezed and another test will be made higher in the hole. Previously, the well yielded gas and distillate with a small amount of water from perforations at 7810-12 feet, total depth 8037 feet, 5½-inch casing set on bottom. Showing is in the Wilcox. Already companies are conducting extensive geophysical programs in Colorado and adjacent northeast, southwest counties.

Gas Discovery: Menefee area, Wharton County, has indications of developing into a large gas reserve with Salt Dome Oil Corporation completing Menefee 2, one-half mile of Menefee 1 discovery, for 5,620,000 cubic feet of gas through ⅜-inch choke, tubing pressure mounting to 1650 pounds. Hole was bottomed at 4618 feet and perforations made at 4536-51 feet, the field discovery sand.

Flank Pay: Phillips Petroleum Company has opened first commercial production on the southwest flank of the Blue Ridge field, Fort Bend County, Robinson 5, lot 14, Duff & Robinson subdivision, Hicks & Shropshire survey, flowing 186 barrels through 3/16-inch choke, tubing pressure 450 pounds, gravity 27.8. Hole was drilled to 4251 feet, 5½-inch casing set to 4166 feet and perforated at 3868-73 feet.

New Tests: First activity in years is scheduled for Withers field. Wharton County, The Texas Company will drill a 7500-foot test at Pierce Estate 119-C, on a 4488-acre lease, 3884 feet from northwesterly line and 3772 feet from southwesterly line of lease.

The Texas Company has staked another flank test on the northeast side at Humble, Harris County, at Koehler Fee 44, J. B. Stevenson survey. It is contracted to 7500 feet, and is 2000 feet south of San Jacinto river. The company has conducted a consistent drilling program on the north and east sides since production was opened on the Stevenson lease in Yegua and Cook Mountain formations.

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New Pay Land Opened in Plaquemines Parish

Humble Oil & Refining Company is waiting on casing to set in Federal 1, Section 1-11s-13e, wildcat on Laurel Ridge prospect in Iberville Parish that has indications of opening a field. Hole is bottomed at 11,650 feet and 7⅝-inch protection casing is set to 10,896 feet. Although details about the well have not been announced, it is credited with some oil and gas shows. The company has staked location for Hymel 1, Section 91-10s-13e.

New Pay: Gulf Refining Company has opened a new pay sand in State-West Bay 9, lease 192, at West Bay in Plaquemines Parish. Hole is bottomed at 10,464 feet and casing is set near bottom. Perforations were made at 10,442-52 feet and the flow was 581 barrels daily through 3/16-inch choke with tubing pressure 4500 pounds. The field produces from shallower sands, but has another well, State 5 in Section 35-22s-30e, flowing from perforations at 10,765-68 feet.

Pine Prairie: The first deep Wilcox test abandonment is reported for the south flank of the Pine Prairie dome in Evangeline Parish, one of the most active areas on the coast. Gulf Refining Company's Chapman-Miller-Lehaye Unit 1 was drilled to 11,007 feet but failed to pick up commercial shows. The field produces from three sands—Wilcox, Sparta, and Cockfield. The company has three other rigs running in the field.

Calcasieu Parish: W. T. Burton has projected a second flank test at Starks following completion of the new sand discovery last week. Lutcher-Moore 1, Section 13-9s-13w, 500 feet east of Lutcher-Moore 10, discovery. The discovery was completed in perforations at 8040-60 feet for 113 barrels of 39.1-gravity oil daily through 3/32-inch choke with 1655 pounds pressure on tubing and 1330 pounds on casing, gas-oil ratio mounting to 1966/1. This sand is by far the outstanding development on the coast this year.

St. Landry Parish: Humble Oil & Refining Company has completed its major extension to Krotz Springs field with Prince 1, Section 25-6s-6e, flowing 20 barrels of condensate hourly through ¼-inch choke. The fluid is 50-gravity and there is a large amount of gas in the flow. Hole is bottomed at 10,150 feet, shut in.

The Texas Company is preparing to sidetrack Swift 1, Section 14-5s-7e, wildcat 2½ miles northeast of Krotz Springs, Section 14-5s-7e. Operators were unable to recover fish in hole, bottomed at 10,617 feet, and plug was set at 8600 feet to sidetrack.

☆

C. W. SANDERS, Houston, has accepted the position of chief geologist for Danciger Oil & Refining Company, at Fort Worth. Before entering the consulting field, Sanders was employed by Shell Oil Company in coordinating geological and geophysical data. He has worked in Eastern Oklahoma, Western Oklahoma, Western Kansas, Eastern Colorado, Eastern New Mexico, West and Southwest Texas, Gulf Coast of Texas-Louisiana-Mississippi, Europe and California.

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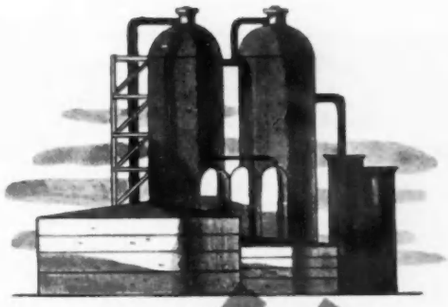

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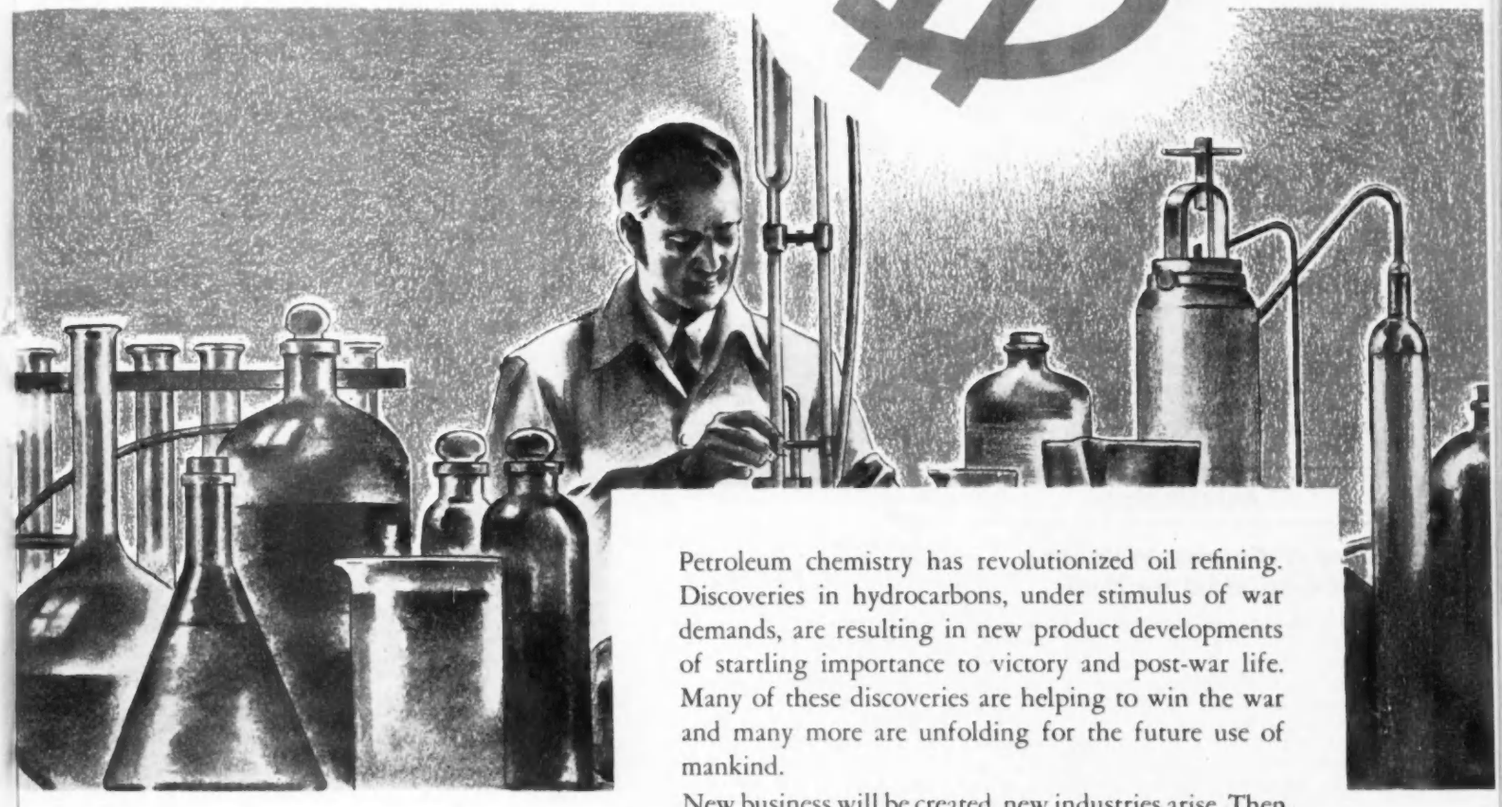

Petroleum chemistry has revolutionized oil refining. Discoveries in hydrocarbons, under stimulus of war demands, are resulting in new product developments of startling importance to victory and post-war life. Many of these discoveries are helping to win the war and many more are unfolding for the future use of mankind.

New business will be created, new industries arise. Then will the world more fully appreciate the extent of oil industry's great contributions to more abundant living.

The Tret-O-lite Company has long shared in the service of the oil industry, providing accurate field tests and chemical compounds for crude oil demulsification.

Crude oil must be treated efficiently and economically. Tret-O-lite compounds, effective and fast, solve all emulsion problems. A capable field engineer, always available, will make tests and recommend the proper compounds to use.

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DEHYDRATING **DESALTING**

Arkansas

El Dorado Active After Wilkes Pool Discovery

Opening of the Wilkes pool northwest of Shuler field in Union County, and proposed drilling of several other wildcat tests in various parts of Union and Columbia counties have led to some of the briskest trading in leases and royalties in years in the El Dorado territory. Many deals for both acreage and royalty in and near the Wilkes area have been consummated, and several blocks are reported being assembled for deep tests.

Meanwhile, the Wilkes pool discovery well, Atlantic Refining Company's Mahoney & Murphy 1, Section 2-18-18, has been completed for the third time and is now making oil at the rate of 100 barrels a day on a 3/16-inch choke. The well came in originally as a large gasser.

Ouachita County: The outcome of the testing of Phillips Petroleum Company's Joyce 1, Section 33-15-15, Smackover field, was awaited with interest. The test should indicate whether the Reynolds is to prove productive in the area.

Union County: Another important wildcat test reached the sand with setting of casing in Lion Oil Refining Company's Powledge 1, Section 20-18-17, at 7212 feet. Total depth is 7415 feet.

In the Rainbow City field, Curtis Kinard has obtained permits for Gaddy 1, C SW SW SW 12-17-14, and Gaddy Estate 1, C NW NE NE, 14-17-14.

Ashley County: Union Producing Company abandoned Crossett 1, Section 3-18-9, and obtained permit to drill Crossett D-2 in the same section, which will be taken to 7000 feet.

Mississippi

Jasper County Wildcat Is Completed by Gulf

Gulf Refining Company has completed Morrison 1, wildcat discovery of Heidelberg field in Jasper County. The well was shut in for storage and the oil from the well probably will be used for fuel to drill nearby tests.

On test the well flowed 408 barrels of 19-gravity oil daily through 3/8-inch top choke, working pressure 95 pounds, from perforations at 4958-68 feet in Eutaw formation. The well is bottomed at 6578 feet, 7-inch casing set to 5075 feet.

Sun Oil Company has staked location for Lindsey 1, C NW NE 31-1n-13e. Road is being built to location. Gulf Refining Company has not staked additional locations.

Rocky Mountain Area

Larimer County Wildcat Is Rated a Discovery

Amerada Petroleum Corporation's Fred H. Hartshorn 1, SE NE SW 15-9n-68w, Clarks Lake wildcat in Larimer County, Colorado, 3 miles southeast of the Wellington field and just north of Fort Collins, on 20-hour test swabbed 168 barrels of fluid, 99 percent oil, from Muddy sand at 5888-5969 feet. Tankage is being erected and the well will go on production. The well, owned jointly by Amerada Petroleum Corporation and Alder Oil Company, was completed late in December at 6510 feet after testing the Sundance sand and finding it water-bearing. Top of the Sundance was logged at 6485 feet. 6⅝-inch casing was cemented at 6163 feet. The Dakota sand at 6112 feet was tested with negative results.

Little Buffalo Basin: Fred Goodstein's Government 1, NE NE NW 13-47n-100w, Tensleep discovery at Little Buffalo Basin, was completed at 4965 feet for 140 barrels daily. Stanolind Oil & Gas Company's test on the north dome of the structure, Unit 1, SW NE 34-48n-100w, has cemented 6⅝-inch production string on top of the Tensleep at 4805 feet after drilling to 5326 feet, and is on production test.

Garland Test: General Petroleum Corporation's Howell 1, Lot 63, 32-56n-97w, important wildcat on the southwest flank of the Garland field, is coring Tensleep sand at 4374 feet reporting "fair" saturation. The well is 60 feet in the Tensleep and although results of drill-stem tests have not been released it is believed the well will prove commercial.

Michigan

Field Openers Increase Output After Treatment

Basin and Rayburns' Weblo 1, S½ NW NW 8-19n-4e, Arenac County, best of three new field prospects in Michigan this year, increased in production from 240 barrels per day natural to estimated potential of 2250 barrels after 1000-gallon treatment in the Dundee lime horizon at 2846 feet. On a seven-hour open test through 2-inch tubing, flow increased steadily from 87 to 116 barrels per hour. Four offset locations have been surveyed for immediate drilling.

Clare County: Leonard and Rowmors' Miltner 1, S½ SW SE, 1-20n-6w, Winterfield Township, Dundee discovery well in the Cranberry Lake pool, completed last year at 3840 feet, will be deepened to 5200 feet to test the Richfield section.

Bay County: United Drillers' Arms 1, S½ SE NW 7-14n-6e, Hampton Township wildcat, completed at 2860 feet in the Dundee in December for a 30-barrel discovery well, is pumping and flowing an average of 91 barrels per day, following deepening to 2867 feet and acid treatment of 500 gallons.

Montcalm County: Stewart and Whites' Jorgensen 1, C NE NE 14-12n-6w, Home Township, is producing from 35 to 67 barrels of oil and from 10 to 20 barrels of water per day by pump and flow from the Dundee at 3477 feet. Source of the water has not been determined. Operators plan to set tubing on a packer at the top of the pay. Socony-Vacuum Oil Company controlling four offsets, is moving in on the west.

☆

GEORGE S. HUME, geologist for the oil controller in Canada, addressed Tulsa Geological Society February 7 and held that vast regions of Northwest Canada are potential producing areas of great importance. Special mention was made of the Mackenzie River Basin.

California

New Oil Field Seen for Aliso Canyon Area

Discovery of what promises to be a new oil field for the Aliso Canyon area, Los Angeles County, announcement of several new wildcat plays of special significance, and a list of wildcat failures for the period that represented only moderate casualties outline the week's principal developments in California field operations.

The Aliso Canyon show was uncovered in Barnsdall Oil Company-Bandini Petroleum Corporation's Roosa 1, 29-3-16, a mile northwest from known limits of Aliso Canyon field. The Roosa zone, as it has been designated, is of Pleiocene age. Topped at 5600 feet, the sand yielded good-looking cores to last reported depth of 5844 feet, with coring still in progress. The company's geologists believe the find is a separate structure.

The largest of the new wildcat plays is a Richfield Oil Corporation venture in Tehama County embracing leases reportedly aggregating around 100,000 acres. Tentative location for a first well, primarily a gas test, is SEc 26-25-3, midway between Corning and Tehama.

Four wildcat abandonments of the week, all in Kern County, were all tries for extensions of known fields, namely Dyer Creek, McClung, Round Mountain and Tejon Ranch. Average depth was 3600 feet.

Fresno County: A new try for Eocene production will be made by The Texas Company in the East Coalinga area, site not yet selected.

Standard Oil Company's wildcat several miles north of Kettleman Hills, Bourdieu 1, baffled in all attempts to get a shutoff on the 7-inch casing at 10,320 feet, is to be cored ahead. Good-looking oil sand cored between 10,332-10,342 feet had raised hopes that an important discovery might be in the making.

Kern County: Richfield Oil Corporation is drilling a deep test in its recently opened new Tejon Ranch field. Objective sand is expected about 2500 feet below the Chanac presently being produced in the other wells.

Seeking a low-gravity pool north and east of Coffee Canyon, E. B. Hall & Company is starting a wildcat in Section 6-28-29. Associated in the 400-acre play are Oceanic Oil Company and Occidental Oil Company.

Limits of the new shallow production in McVan area opened by Pacific Western Corporation may be appreciably extended by Golden Bear Oil Company's Newhope 7, 29-27-27, brought in flowing at an estimated 150-barrel rate.

Los Angeles County: Discovery in an old well at the southeastern end of the old Torrance field of about 100 feet of oil sand, topped at 3200 feet, is announced. Successful completion would open possibilities for working over a great number of old wells in which the zone was passed up when they were drilled, most of them many years ago.

Chances for finding production similar to that of East Coyote field in Sunny Hills area, west from that pool, appear much better. Barnsdall Oil Company's wildcat cored about 25 feet of oil sand just below 6200 feet, and is coring ahead, last reported depth 6345 feet.

United States Well Completions

ARKANSAS

Columbia County — Dorcheat - Macedonia: Phillips' Mrs. J. S. McWilliams 1, n½ se¼ 13-18s-22w, dual comp, Cotton Valley 7000-20, flow 85 bbls 62-gr distil, 3/16-in, 1850 lbs; lime 8900-30 ft, 96 shots, 131 bbls distil, 3/16-in, 2100 lbs.

Phillips' McWilliams 1, c w½ se 15-18-22, limestone gas, pay 8906 ft, perf 72 shots 8906-8930 ft, 124 bbls, 3/16-in; sandstone gas, pay 7052 ft, perf 8 shots 7052-54 ft, 186 bbls, td 8939 ft.

Devonian Oil Co.'s Snider-Dodson 1, c n½ sw 20-18-21, pay 8860 ft, perf 8058-8077 ft, 125 bbls, 18/64-in, td 8995 ft.

Columbia County—West Atlanta Extension: Tide Water's Paul Young 1, 18-18s-19w, flow 190 bbls clear distil, lime 8273-75 ft, 14,000/1 gor, 2200 lbs, td 8296 ft. Will test another zone.

ARKANSAS WILDCAT

Ashley County—Failure: Union Prod. Co.'s Crossett Lumber Co. D-1, 1821 s 1990 e nw cor 3-18-9, abnd 2800 ft.

CALIFORNIA

Fresno County—Coalinga: Shell's 152-32, sw ne ne 32-19-15, pump 147 bbls, perf 2630-2587, 2570-15 ft, td 2632 ft.

Standard's 71-33A, nw ne ne 33-19-15, pump 14 bbls 17.1-gr, 171 ft perf 2862 ft, td 2900 ft.

Texas Co.'s A-5, sw sw ne 6-20-15, pump 17 bbls oil, 6 wtr, 36 ft perf 1415 ft, td 1430 ft, pb 1420 ft.

Fresno County—Coalinga, East & Eocene: Standard's 57-13C, sw se 13-20-15, flow 551 bbls 29.8-gr oil, 195,000 gas, 16/64-in, 800/1000 lbs, 248 ft perf 7825 ft, td 7830 ft.

Fresno County—Raisin City: Seaboard Oil Corp.'s S. T. U. 35-13, nw ne sw 13-15-17, flow 300 bbls 25.8-gr oil, 1,000,000 gas, 16/64-in, 1940/250 lbs, perf 6296-62, 6248-38 ft, td 6317 ft.

Kern County—Belridge, South: Belridge Oil Co.'s 25-34, ne nw sw 34-28-21, pump 30 bbls 15.1-gr oil, 8 sand and wtr, perf 404-800 ft, td 800 ft.

Belridge Oil Co.'s 35-34, nw ne sw 34-28-21, pump 25 bbls 15.1-gr oil, 12 wtr, perf 427-850 ft, td 850 ft.

Chanslor Canfield Midway Oil Co.'s B. F. 11-17, ne se sw, pump 20 bbls 14-gr, perf 1160-70, 1250-55 ft, td 1420 ft.

General Pet. Corp.'s 57-2, sw se ne 2-29-21, pump 45 bbls 15.5-gr oil, 6 wtr, perf 565-650, 700-815, 862-900, 926-39 ft, td 940 ft.

Kern County—Kern Front: Pacific Western Oil Corp's Robinson A-20, ne sw ne 22-28-27, pump 56 bbls 13.5-gr oil, 35 wtr, perf 2219-2379, 2456-2501 ft, td 2501 ft.

Kern County—Lost Hills: Richfield's "A" 4, ne nw ne 5-27-21, pump 13 bbls 25.5-gr, 206 ft perf 1495 ft, td 1500 ft.

Kern County—McKittrick: Barnsdall's Potter Jantha Fee 3, se nw ne 6-30-22, pump 55 bbls 12.2-gr, 42 ft perf 1363 ft, td 1365 ft.

Kern County — Midway - Sunset: Chanslor Canfield Midway Oil Co.'s "G" 32-25, 235 ft n 1320 ft e w¼c 25-31-22, pump 28 bbls, perf 2229-2472 ft, td 2475 ft.

Standard's 52-29D, sw nw ne 29-32-24, flow 215 bbls 24.8-gr oil, 1,320,000 gas, 24/64-in, perf 3163-3300 ft, td 3340 ft.

Kern County—Mount Poso: Dwight G. Vedder's 3-18, se nw se 18-27-28, 59 ft perf 2462 ft, td 2462 ft.

Kern County—Poso Creek-Premier: Westates Pet. Corp.'s Cauley 50, 1564 ft n 1320 ft e swc 16-28-27, pump 200 bbls, 63 ft perf 2902 ft, td 2902 ft.

Kern County — Round Mountain: General Pet. Corp.'s Railroad 3, se ne se 23-28-28, pump 213 bbls 14-gr, 21 ft perf 2503 ft, td 2503 ft.

Kings County — Kettleman, North Dome: Standard's 333-21Q, c ne sw 21-22-18, flow 224 bbls, 6⅝-in casing 9870 ft, td 10,190 ft.

Los Angeles County—Wilmington: Long Beach Oil Dev. Co.'s "W" 64, 173 ft nely alg n/l Seaside fr e side 27th Ave then 300 ft sely at r/a, flow 252 bbls 21.6-gr, 14/64-in, 520/660 lbs, perf 2483-2542, 2597-2731, 2773-2815 ft, td 2821 ft.

Long Beach Oil Dev. Co.'s "W" 66, 561 ft nely on n/l Seaside fr e side 27th Ave then 1832 ft sely at r/a, pump 172 bbls 15.9-gr, perf 3255-3584, 3623-67 ft, td 3669 ft.

J. L. O'Donnell's Ferrell 1, 370 ft ely on c/l Lowen St fr c/l Van Tress then 105 ft sly parallel fo Van Tress, pump no est, perf 3184-3294, 3542-3661 ft, found hole in tbg, td 3661 ft.

Orange County—Huntington Beach: Southwest Exp. Co.'s State J-4, 445 ft w on proj c/l Ocean fr c/l 23rd St then 123 ft n at r/a, 10-6-11, flow 438 bbls 19.5-gr, 16/64-in, 480/245 lbs, perf 2910-4096 ft, td 4434 ft, pb 4096 ft.

Standard's E-14, 270 ft swly on c/l 23rd St fr c/l Wesley Ave then 270 ft sely at r/a, pump 90 bbls 14.2-gr oil, 22 wtr, 86 ft perf 2506 ft, td 2509 ft.

Standard's P. E. 28, 468 ft nwly on c/l Ocean Ave fr c/l 23rd St then 125 ft swly at r/a, pump 554 bbls 18-gr oil, 50 wtr, perf 2390-2465, 2791-3548 ft, td 3550 ft.

Orange County—Yorba Linda: Shell's Olinda Fee Four 67A-16, 2349 ft n 1606 ft w c/l Citrus and Eureka Ave, pump 274 bbls 12.2-gr oil, 130 wtr, perf 2310-2248, 2205-2151 ft, td 2468 ft, pb 2317 ft.

Santa Barbara County—Gato Ridge: Barnsdall's Tognazzini 7, 740 ft s 1399 ft e nec Rancho Los Alamos, 9-8-32, pump 197 bbls 10.7-gr, perf 2327-2555, 2816-3191, 3492-3979 ft, td 3981 ft.

Santa Barbara County—Santa Maria Valley: Bel Air Oil Co.'s Twitchell 3, ne ne nw 35-10-34, pump est 2000 bbls, 647 ft perf 5552 ft, td 5575 ft.

Brain & Kohler's Rembusch 3, sw ne ne 35-10-34, pump 75 bbls oil, 225 wtr, 550 ft perf 5539 ft, td 5535 ft.

CALIFORNIA WILDCATS

Kern County—Failures: Shell's Cairns 1, se ne ne 14-26-27, Dyer Creek area, Vedder barren and gray 2255 ft, abnd 2271 ft.

Continental's KCL H-1, sw sw ne 18-30-26, McClung area, abnd 8495 ft.

Trico Oil & Gas Co.'s Caldwell 1, se sw sw 5-28-29, Round Mountain area, poor, oil-stained sand 1181-1222 ft, abnd 1281 ft.

Richfield's Tejon A-21-2, ne nw nw 2-10-19, Chanac zone barren and wet, abnd 2473 ft.

ILLINOIS

Clay County: Shell's L. Moss 5, nw sw sw 14-5n-5e, Cyp 2132-46 ft, AV 2340-49 ft, 33 bbls, 2358 ft.

W. C. McBride's Duff 2, nw sw nw 35-4n-7e, Cyp 2604-15 ft, 32 bbls, 2660 ft.

J. J. Lynn's B. Anderson 1, nw ne nw 30-3n-6e, Ben 2678-86 ft, 27 bbls, 2686 ft.

Edwards County: Texas' A. Hays 1, 559 ft sl 564 ft wl sw sw 3-1n-10e, abnd 3323 ft.

Fisher Oil Co.'s G. Wick 1, se sw ne 36-2s-10e, Walts 2407-41 ft, 45 bbls, 2441 ft.

Texas et al's R. Tate 1, ne ne ne 36-2e-10e, Walts 2370-79 ft, 89 bbls, 2386 ft.

Effingham County: P. D. Lynch's Gilmore 1, ne nw nw 34-6n-5e, abnd 2380 ft.

Hamilton County: Texas' S. L. Johns 3, nw sw se 34-6s-6e, AV 3143-51 ft, 48 bbls, 3151 ft.

Jefferson County: Magnolia's C. W. Pierce B-1, sw se 14-1s-4e, abnd 2937 ft.

Nash Redwine's Casey-Howard 2, 705 ft el 605 ft sl se ne 6-3s-3e, abnd 2843 ft.

Madison County: L. A. Oberling et al's Beckman-Pence Comm 1 (DD), se se se 9-4n-6w, Dev 1695-1717 ft, 264 bbls, 1717 ft, otd 1698 ft.

L. A. Oberling & Bryant's A. Schoeck 3, ne sw ne 27-3n-6w, Trenton 2331-44 ft, 72 bbls, 2344 ft.

Marion County: Texas' C. Peters 2, sw nw nw 34-2n-2e, Ben 1864-67 ft, 9 bbls, 1877 ft.

Texas' H. Boles 1, se sw nw 15-1n-2e, Rosi 2094-2101 ft, 136 bbls, 2112 ft.

Posey County: Superior's H. C. Ford et al's F-3, se nw ne 34-4s-14w, Walts 2096-2108 ft, TS 2235-38 ft, 60 bbls, 2241 ft.

Richland County: James L. Black's A. N. Hunt 2, nw sw ne 10-3n-9e, Cyp 2579-85 ft, 5 bbls, 2589 ft.

Saline County: Jarvis & Marcell's Rufus Raley 1, nw sw sw 10-10s-6e, abnd 2074 ft.

Wabash County: A. Baldwin's G. Dunkel 3, 3400 ft sl 1860 ft wl 5-1s-12w, Biehl 1478-1508 ft, Jordon 1524-33 ft, 112 bbls 1533 ft.

Texas' Stein 5, 500 ft nl 620 ft el nw 8-1s-12w, TS 1700-16 ft, 151 bbls, 2053 ft.

Wayne County: Pure's H. C. Scheidt 1, 100 ft w of sw sw 28-1s-7e, McCl 3272-79 ft, 182 bbls, 3285 ft.

Pure's S. S. Allen 4, ne ne 11-1s-8e, McCl 3092-3107 ft, 263 bbls, 3110 ft.

Pure's J. Van Fossen "A" 2, sw sw 14-1n-8e, Rosi 3009-15 ft, McCl 3108-15 ft, 845 bbls, 3120 ft.

Pure's Fitch Cons. 1, ne ne 15-1n-8e, McCl 3081-97 ft, 3130-34 ft, 3142-47 ft, 3154-58 ft, 27 bbls, 3165 ft.

Pure's A. E. Michels "C" 2, se ne se 26-2n-7e, AV 2909-22 ft, 106 bbls, 2960 ft.

White County: Great Lakes Carbon's V. G. & W. L. Miller 2, nw sw ne 28-6s-10e, TS 2272-80 ft, 147 bbls, 2287 ft.

S. C. Yingling's E. & C. Potter Comm. 1, 2950 ft sl 4000 ft wl 20-3s-14w, Pal 2098-2110 ft, Cyp 2772-90 ft, 56 bbls, 2790 ft.

George & Wrather's Karshaw 1, nw sw ne 25-3s-10e, abnd 3142 ft.

ILLINOIS WILDCATS

Franklin County—Failure: George Allison et al's C. E. Shirley 1, se ne ne 29-5s-3e, abnd 3133 ft.

Jefferson County—Failure: Kewanee Oil & Gas Co.'s E. G. Webb 1, ne nw sw 4-3s-3e, abnd 2950 ft.

Jefferson County—Discovery: Central Pipe Line Co.'s J. T. Henry 2, sw ne se 13-2s-4e, AV 2943-60 ft, 170 bbls, 2960 ft.

Madison County—Discovery: L. A. Oberling's et al Beckam-Pence Comm. 1 (DD), se se se 9-4n-6w, Dev 1695-1717 ft, otd 1698 ft, 264 bbls, 1717 ft.

Wayne County—Discovery: Felix Jablonski's Yorndorf 1, nw nw 3-1n-9e, AV 3100-19 ft, 47 bbls, 3226 ft.

Wayne County—Failure: Stanolind's Seifert-Fisher Comm. w½ sw nw 35-2s-9e, abnd 3409 ft.

Wells Completed in United States in Week Ended February 12, 1944

Data preliminary and subject to revision. Revised and more complete data on all completions shown in monthly summary of drilling, published in second issue of each month. More detailed data on wildcats published in third issue of each month.

State or District	FIELD COMPLETIONS: New Wells: *Oil	Gas	†Input	Dry	Total	Old Wells Deepened	WILDCAT COMPLETIONS: *Oil	Gas	Dry	Total	ALL COMPLETIONS: This Week	Last Week	Cumulative: This Year	Last Year
Arizona	....	....	....	....	....	....	....	....	....	....	....	1	1	....
Arkansas	2	....	....	....	2	1	....	....	1	1	4	4	20	20
California	28	....	....	....	28	....	....	....	4	4	32	26	203	130
Colorado	....	....	....	....	....	....	....	....	....	....	....	....	2	5
Georgia	....	....	....	....	....	....	....	....	....	....	....	....	....	1
Illinois	20	....	....	6	26	1	3	....	3	6	33	30	250	218
Indiana	4	....	....	4	8	....	1	....	3	4	12	5	46	33
Iowa	....	....	....	....	....	....	....	....	....	....	....	....	....	1
Kansas	2	....	....	1	3	....	2	....	5	7	10	43	235	172
Kentucky	8	....	....	3	11	....	2	....	1	3	14	12	67	26
Louisiana	2	1	....	1	4	....	....	....	1	1	5	14	62	55
North Louisiana	....	....	....	....	....	....	....	....	....	....	....	6	16	16
South Louisiana	2	1	....	1	4	....	....	....	1	1	5	8	46	39
Michigan	5	....	....	....	5	....	1	....	....	1	6	8	68	47
Mississippi	....	....	....	....	....	....	....	....	....	....	....	....	3	7
Missouri	....	....	....	....	....	....	....	....	....	....	....	....	2	2
Montana	....	....	....	....	....	....	....	....	....	....	....	1	27	34
Nebraska	....	....	....	....	....	....	....	....	....	....	....	1	7	7
New Mexico	2	....	....	....	2	....	....	....	1	1	3	11	49	26
New York	15	1	10	....	26	....	....	....	....	....	26	25	148	143
Ohio	3	10	....	8	21	....	....	....	....	....	21	20	84	108
Oklahoma	2	1	....	4	7	....	....	....	....	....	7	27	167	168
Pennsylvania	28	7	14	....	49	....	....	....	....	....	49	45	305	287
Tennessee	....	....	....	....	....	....	....	....	....	....	....	....	1	1
Texas	56	2	1	13	72	2	4	....	23	27	101	103	631	439
E.Tex.Bor. Co.'s	....	....	....	....	....	....	....	....	....	....	....	1	1	1
Rest of E. Texas	2	....	....	....	2	....	....	....	4	4	6	7	38	25
North Texas	7	....	1	3	11	1	1	....	4	5	17	31	137	101
W. Central Tex.	3	1	....	3	7	....	....	....	4	4	11	6	49	36
West Texas	26	....	....	2	28	1	1	....	4	5	34	18	164	94
Tex. Panhandle	4	....	....	....	4	....	....	....	....	....	4	3	21	37
G. Coast, Upper	2	....	....	....	2	....	1	....	1	2	4	9	51	28
G. Coast, Lower	10	1	....	3	14	....	1	....	3	4	18	20	115	60
Southwest Texas	2	....	....	1	3	....	....	....	3	3	6	4	46	48
S. Central Texas	....	....	....	1	1	....	....	....	....	....	1	4	9	9
West Virginia	....	18	....	3	21	....	....	....	....	....	21	14	127	83
Wyoming	....	....	....	....	....	....	....	....	....	....	....	1	15	25
Total U.S.	177	40	25	43	285	4	13	....	42	55	344	391	2,520	2,038

* Includes distillate wells. † Includes salt water disposal wells.

The OIL WEEKLY'S TRADING POST

USED EQUIPMENT FORUM

CLASSIFIED ADS . . . EQUIPMENT . . . SERVICES . . . PERSONNEL

FOR SALE

■ FOR SALE—Complete Drilling Rig
- 1 New 14 x 14 Ideal Ajax engine
- 1 9" Emsco draw works with hydromatic brakes
- 1 New 20" Wilson-Snyder pump
- 2 18" Wilson-Snyder pumps (completely overhauled)
- 1 New giant 350 ton IDECO traveling block
- 1 New IDECO 5-sheave 350 ton crown block with interchangeable sheaves with traveling block
- 3 125 x 300 Kewanee boilers with 2—10 x 4½ x 10 National Transit boiler feed pump units with 1—10 x 4½ x 10 Worthington pump
- 1 20½" fully oil bath Emsco rotary
- 1 122' 535,000 lb. capacity Lee C. Moore derrick
- 1 8' steel substructure with all timbers

9100' 4½" 16.60 lb. regular Acme full hole drill pipe
- 2 7¼ x 20' drill collars, all necessary subs
- 1 20' type J. Hughes conventional core barrel
- 1 4½" B J elevator
- 1 Set B J elevator bails
- 1 3 K. W. Moon generator

2000' 1⅛" Wickwire-Spencer drilling line

10000' 9/16" galvanized coring line
- 1 7' x 12' steel tool house
- 1 7' x 15' clothes changing house
- 1 4½" with 3" horse cocks Goodall hose
- 1 Type a 300 ton Union Tool Company swivel
- 1 10" Union Tool Company hook
- 1 40' x 4½" Baash-Ross kelly with drive bushings
- 1 Link belt shale shaker
- 1 10¾" x 3000 lb. W.P. Cameron blowout preventer fluid closed and manually opened with 1500 series API regular grooved flanges on both sides

All merco stops on mud manifold rigged up with 4", 6000 lb. Thornhill-Craver unibolt union, 4" steel lines from boiler to rig with unions on each joint, casing and pipe racks of fir timber.

Rig now operating and new pump, engine, drill and coring line made two wells. Was completely overhauled from top to bottom before location, painted throughout. Price $90,000.00 cash. Address: Box 20, c/o The Oil Weekly, Houston, Texas.

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Without Priority

4-18" Gumbo Buster Steam Pumps

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OIL FIELD TOOL & SUPPLY CO.
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GAS RECYCLING PROJECT

By large, independent having available, new, complete compression equipment capable of handling large volume and high pressures. Interested in high pressure wet gas area, good gasoline content, good reserves, sufficient wells already drilled for a recycling operation. Prefer project with gasoline extraction plant already operating but with limited market for residue dry gas. Give all information possible first letter. P. O. Box 1914, Fort Worth, Texas.

NOTICES

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■ LEASE BLOCK (720 A.) semi-proven; sands 970' and 1640'; offsetting 200 bbl. discovery well. 41-G. Close to production and refinery. Sell for development or trade part for well. Geologist, 912 So. 2nd, Lawton, Okla.

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■ Capital Seekers—Interested in raising $25,000 or more for a legitimate project should write to Amster Leonard, Fox Theater Bldg., Detroit 1, Mich.

ADVERTISING RATES

TRADING POST SECTION

Regular classified advertisements for this special section, set in type this size without border, take flat rate of 7 cents per word for the first insertion and 5 cents per word for each subsequent insertion of same copy. Display advertisements for this section, set in suitably larger type with ruled border, are $5.00 per inch for first insertion and $4.00 per inch for subsequent insertions. Remittance must accompany copy which should be sent to:

Trading Post Section. THE OIL WEEKLY
P. O. Box 2608 Houston 1, Texas

INDIANA

Gibson County: Continental's Bozeman Land Co. 67, ne ne ne 26-3s-14w, Walts 2078-2109 ft, 26 bbls, 2100 ft.

Greene County: Ben A. Branch's Floys & Julia Chapman 1, ne sw nw 30-7s-6w, abnd 923 ft.

Jay County: John Seip's E. A. Carson 1, ne ne nw 25-24n-13e, Trenton 1036-50 ft, 5 bbls, 1050 ft.

Pike County: W. P. Dearing's W. S. Willis, ne ne se 1-1s-9w, abnd 1606 ft.

K. D. Holland's John McAtee 7, 1110 ft wl 3800 ft sl 33-1n-9w, McCl 1625-31 ft, 7 bbls, 1631 ft.

Posey County: Mohawk et al's Walgrove 1, se nw ne 14-5s-14w, abnd 2976 ft.

Sinclair Wyoming's Elliot 1, ne nw se 14-5s-14w, abnd 2499 ft.

Carter's Skiles 3, ne nw se 15-8s-15w, TS 2042-68 ft, Cyp 2392-2419 ft, 45 bbls, 2845 ft.

INDIANA WILDCATS

Dubois County—Failure: E. S. Holman's O. B. Wilson 1, se ne se 24-1n-6w, abnd 891 ft.

Pike County—Discovery: Farm Bureau Oil Co.'s Lennis Shoultz 1, nw se sw 16-1s-9w, McCl 1697-99 ft, 30 bbls, 1699 ft.

Sullivan County — Failure: J. W. Rudy's Wabash Valley Land & Coal Co. 1, se nw nw 10-6n-10w, abnd 2968 ft.

Tippecanoe County—Failure: Arthur Wolf's Fee 1, ne nw se 10-24n-3w, abnd 906 ft.

KANSAS

Barton County—West Ainsworth: Continental's F. J. Schreiber 3, nw se se¼ 32-16s-13w, Arbuckle 3343 ft, 1737 bbls, td 3353 ft.

Rooks County: Continental's Brueggeman 1, ne 5-10s-20w, Base F. Hayes 294 ft, Anhy 1741 ft, Topeka 3269 ft, Lans 3505 ft, sso 2600-03 ft, 3617-12 ft, 3682-87 ft, 3717-20 ft, Arb 3823 ft, swab 50 bbls, td 3843 ft.

Sheridan County: Continental's C. A. Croffoot 1, sw se 35-7s-26w, (previously carried as No. 20 start), Lans 3744 ft, perf 2869-74, 3864-69, 3875-79, 3820-28, 3815-20, 3828-33, 3771-81, 3781-86, 3765-70 ft, ns except last perf, ½ bbl wtr with rainbow so was encountered, abnd 3925 ft.

KANSAS WILDCATS

Cowley County—Failure: Continental's R. M. Davis 1, nw ne n 3-23s-6e, B Ville, Miss 3078 ft, abnd 3185 ft.

Cowley County—Discovery: Grallup, McNish et al's Dunn 1, ne se 28-34s-5e, Miss 3046 ft, 10 bbls oil, 20 bbls wtr, td 3070 ft, pb 3017 ft.

Greenwood County—Failure: Bert Ash et al's Miller 1, ne sw 15-26s-13e, Miss Chat 1872 ft, sso 1873-80 ft, Miss lime 1908 ft, abnd.

Leavenworth County—Failure: Chas. Miller's Corlett 1, se sw se 23-9s-21e, as 1318 ft, Miss 1395 ft, abnd 1555 ft.

Ness County — Discovery: Falcon-Seaboard & Sohio's Frevely 1, c se se 22-16s-25w, lime sso, Miss 4537, sso 4429-35 ft, sso 4501-07 ft, td 4562 ft, pb 4550 ft.

Phillips County: N. Appleman's Steel 1, sw se 3-5s-20w, no test, no support.

Saline County—Failure: E. S. Adkins 1, sw nw 33-14s-2w, Topeka 1552 ft, Lans 2047 ft, Base N. C. 2342 ft, Miss 2681 ft, Kinderhook 2943 ft, Hunton 3080 ft, Sylvan Maquoketa 3180 ft, Cherty Viola 3259 ft, Viola 3302 ft, Simp 3389 ft, abnd 3446 ft.

KENTUCKY

Butler County: J. W. Sander's M. Cook 2, 8-H-32, Hds 502-26 ft, 36 bbls, 526 ft.

Sanders & Wicker's Sumner 2 (3), 8-H-32, Hds 475-502 ft, 18 bbls, 502 ft.

Bennett Bros.' W. Cook 3, 13-H-32, Hds 510-35 ft, 5 bbls, 535 ft.

Daviess County: Illey Browning's Strum 6, 2-N-23, Walt 1811-22 ft, TS 1914-24 ft, 275 bbls, 1934 ft.

Henderson County: Illey Browning's Strum 7, 2-N-23, Walt 1828-42 ft, TS 1935-42 ft, 330 bbls, 1949 ft.

W. F. Lacy's Clore 4, 16-Q-22, abnd 1870 ft.

W. F. Lacy's Wooks 4, 16-Q-22, TS 1846-56 ft, 125 bbls, 1865 ft.

Miller & Shiarella's C. E. Moore 1, 16-P-21, McCl 2568-76 ft, 360 bbls, 2576 ft.

Ohio County: Mecca Oil Company's L. H. Davison 1 (4), 3-M-31, abnd 792 ft.

Union County: E. J. Ruwaldt's P. Negley 1, 20-P-19, Cyp 2178-2209 ft, 356 bbls, 2214 ft.

KENTUCKY WILDCATS

Henderson County—Discovery: C. D. Burbank's Fee 3, 3-P-21, Penn 1507-18 ft, 40 bbls, 1521 ft.

Muhlenberg County—Failure: A. A. Peard et al's Nabb Bros. 1, 19-C-28, abnd 1300 ft.

Union County — Discovery: Sohio's Bessie Boswell 2, 14-O-18, McCl 2820-24 ft, 132 bbls, 2952 ft.

SOUTH LOUISIANA

Calcasieu Parish—Perkins: E. R. Brann & North American Con.'s Edgewood Land & Logging 2-A, 660 ft n&w of se cor 30-7s-10e, 7-in 5395 ft, perf 5372-76 ft, flow 20,000,000 gas, shut-in, td 5429 ft.

Plaquemines Parish — Quarantine Bay: Gulf's State-Bay 38, 7121 ft e on nl fr nw cor sec 7 102 ft n at ra in Bay-19s-17e, 5½-in

Continental Red Seal Engines

Your Dollars Are Power, too . . . Buy War Bonds

POWER TO WIN

This new Continental Red Seal Engine is built to "take it."

It is the model R602 which means a six-cylinder engine with a piston displacement of 602 cubic inches.

Gruelling work and uninterrupted service have endeared this engine to thousands of our fighting men overseas.

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OKLAHOMA CITY—Diesel Power & Mach. Co.
TULSA—Diesel Power & Machinery Co.
WICHITA FALLS—Wichtex Machinery Co.

Continental Motors Corporation
MUSKEGON, MICHIGAN

9633 ft, perf 9560-74 ft, 27 bbls, 9/64-in, td 9633 ft.

St. Mary Parish—Bayou Sale: Texas Co.'s State-East Cote Blanche Bay 6, s 18° 16 mins w, 11,032 ft fr USCGS Mon "South Bend" in Bay T-16s-9e, 5½-in 10,170 ft, perf 10,100-118 ft, 300 bbls, 9/64-in, td 10,170 ft.

Evangeline Parish — Pine Prairie: Gulf's Chapman-Miller-Lehaye 1, s flank, 1688 ft n&e of sw cor 2-4s-1w, abnd 11,007 ft.

SOUTH LOUISIANA WILDCAT

Terrebonne Parish—Failure: Gulf's South Shore Oil 1, Presque Isle area, 28-17s-18e, abnd 12,021 ft.

MICHIGAN

Arenac County—North Adams: Ervin Major's Bryan 3, se se sw 22-19n-3e, Dundee lime, flow 480 bbls in 10 hrs after acid, td 2916 ft.

Bay County—Kawkawlin: Gulf's Carl 1, n½ sw sw 2-14n-4e, Dundee lime, pump & flow 55 bbls, td 2912 ft.

Mecosta County—Fork: Smith Pet. Co.'s Adelaide 1, s½ ne se 7-16n-7w, Dundee lime, flow 260 bbls, td 3834 ft.

Osceola County—Rose Lake: Sun's Loop 1, s½ sw nw 6-18n-9w, Traverse lime, flow 388 bbls, td 3175 ft.

Van Buren County — Breedsville: Socony Vacuum's Varnum 4, se se sw 24-1s-16w, Traverse lime, pump 21 bbls, td 1092 ft.

MICHIGAN WILDCAT

Gratiot County—Failure: A. E. William's Ryan 1, sw sw se 32-10n-1w, Dundee 2948 ft, td 2975 ft.

NEW MEXICO

Eddy County: Grayburg Oil Co.'s Dexter 1, c se nw 24-17s-29e, flow 200 bbls, ¾-in, 1500 gals acid 2880-2977 ft.

Lea County—Maljamar: Kewanee Oil Co.'s Miller 6-A, c sw se 23-17s-32e, flow and swab 409 bbls, shot 200 qts 4130-4215 ft, 190 qts 3970-4040 ft, td 4253 ft.

NEW MEXICO WILDCAT

San Miguel County—Failure: Great Lakes Carbon Corp.'s Earickson 1, 1320 ft snl 1984 ft ewl 1-15n-12e, abnd in granite 970 ft.

OKLAHOMA

Caddo County—Apache: Cities Service's Kee Har To 2, ne nw ne¼ 11-5w-12w, sand 3947 ft, sand 6547-62 ft, td 6668 ft, pb and abnd 4012 ft.

Caddo County — West Cement: Phillips' Fletcher 6, sw sw nw¼ 34-6n-10w, Medrano sand 5701 ft, perf 5915 ft, 351 bbls, td 5960 ft.

Garvin County—Pauls Valley: Pure Oil's Teter 13, nw ne sw¼ 31-4n-1e, Bromide Dense 3825 ft, sand 3951 ft, 627,000 gas, td 4096 ft.

Ohio & Continental's A. W. Hutchins se se se¼ 23-4n-1w, abnd.

Ohio's A. W. Hutchins "A" 2, se nw ne 26-4n-1w, abnd.

Hughes County—Horns Corner: Deep Rock's Price "C" 1, sw se se 20-7n-10e, td 4178 ft.

Oklahoma County — W. Edmond: Sohio's Benzer 1, ne ne nw 5-13n-4w, 300 bbls, td 7178 ft.

WEST TEXAS

Andrews County—Mabee: Texas Co.'s Mabee 2, c sw ne G&MMB&A 44, blk 40, T-2-N, elev 2952 ft, pump 230 bbls oil, 41 bbls wtr, 10,000 gals acid San Andres 4704-62 ft.

Texas Co.'s Mabee 3, c se nw G&MMB&A 32, blk 40, elev 2909 ft, Grayburg 4410 ft, San Andres 4660 ft, pump 178 bbls oil, 58 bbls wtr, 12,000 gals acid 4663-4720 ft.

Cochran County—Rhodes: Atlantic's Dean 3, 660 ft out ne cor lab 12, lge 90, Lipscomb CSL, flow 453 bbls, 12,000 gals acid 5035-78 ft.

Cochran County—Slaughter: Jerry Hawkins et al's Mallet 68-A, 580 ft out ne cor lab 6, Lge 47, Edwards CSL, flow 282 bbls, ¾-in, 9000 gals acid 4876-4955 ft.

Magnolia's Mallet 19-C, 580 ft out ne cor lab 21, Lge 53, Scurry CSL, flow 891 bbls, 10,500 gals acid, td 5038 ft.

Superior's Dean 19, 3370 ft nsl 440 ft wel Lge 57, Martin CSL, pump 332 bbls, 6000 gals acid 4874-4951 ft.

Crane County—McElroy: Tide Water's University 1-T, 2200 ft nsl 440 ft wel e½ of w½ sec 28, blk 30, abnd 3615 ft.

Ector County—Goldsmith: Bay Pet. Corp's Cummins-Sinco 2, 2200 ft ewl 800 ft nsl T&P 26, blk 45, T-1-N, flow 190 bbls, ¼-in, 6000 gals acid 4265-4318 ft.

Stanolind's Cummins 3-A, 330 ft nsl 1005 ft ewl PSL 10, blk A, pump 7 bbls oil, 24 bbls wtr, 11,000 gals acid 4185-4228 ft.

Gaines County—Seminole: Magnolia-Atlantic's H. & J. 10-193, c ne sw W. T. Ry. 193, blk G, flow 454 bbls, ¼-in, shot 157 qts 5131-5211 ft.

Hockley County—Slaughter: Jerry Hawkins et al's Mallet 64-A, 510 ft out se cor lab 11, Lge 47, Edwards CSL, flow 384 bbls, 8500 gals acid 4950-82 ft.

Jerry Hawkins et al's Mallet 71-A, 580 ft out sw cor lab 7, Lge 47, Edwards CSL, flow 386 bbls, 8500 gals acid 4923-52 ft.

Jerry Hawkins et al's Mallet 74-A, 580 ft out se cor lab 7, Lge 47, Edwards CSL, flow 475 bbls, 8500 gals acid 4946-75 ft.

Jerry Hawkins et al's Mallet 83-A, 580 ft out ne cor lab 9, Lge 47, Edwards CSL, flow 248 bbls, 8500 gals acid 4933-82 ft.

Jerry Hawkins et al's Mallet 109-A, 580 ft out se cor lab 2, Lge 47, Edwards CSL, flow 243 bbls, 8500 gals acid 4941-84 ft.

Magnolia's Mallet 19-E, 580 ft out ne cor lab 19, Lge 49, Scurry CSL, flow 885 bbls, 10,500 gals acid, td 5030 ft.

Permian Oil Corp.'s Mallet 26-B, 510 ft out nw cor lab 20, Lge 47, Edwards CSL, flow 853 bbls, 11,000 gals acid 4980-5010 ft.

Stanolind's Slaughter 27-A, 510 ft out se cor lab 54, Lge 37, Zavalla CSL, flow 453 bbls, 10,000 gals acid 5013-73 ft.

Stanolind's Wiley 1, 550 ft nsl 440 ft ewl lab 2, Lge 42, Rains CSL, flow 408 bbls, 8000 gals acid 4854-90 ft.

M. C. Starkey et al's Elliott 1-C, 440 ft out sw cor e½ lab 3, Lge 42, Rains CSL, flow 477 bbls, 7000 gals acid 4836-77 ft.

Trinity Dr. Co.'s Slaughter 4, 1749 ft snl 440 ft ewl lab 27, Lge 35, Zavalla CSL, flow 985 bbls, 12,000 gals acid 5020-53 ft.

Howard County: Continental-Group 1 Oil Corp.'s Settles 3-B-160, nw ne sw W&NW 160, blk 29, abnd 1357 ft.

Howard County—Iatan-East Howard: Stanolind's Echols 1-B, ne ne se T&P 6, blk 30, T-1-S, pump 202 bbls oil, 11 bbls wtr, 3000 gals acid 2500-2650 ft.

Stanolind's Texas L&M Co. 17, 1001 ft snl 979 ft ewl T&P 5, blk 30, pump 285 bbls, 2450-2586 ft.

Howard County—Morita: John B. Hawley Jr.-Northern Ordnance's Wilkinson 1, c sw ne T&P 33, blk 34, T-1-N, elev 2478 ft, Yates 1749 ft, San Andres 3062 ft, pump 35 bbls, shot 500 qts 3170-3240 ft, 1020 qts 3165-3240 ft, td 3270 ft.

Reagan County — Barnhart: Amerada's Johnson 2, 2027 ft snl 4620 ft ewl HE&WT Ry. 5, elev 2725 ft, base black shale 8940 ft, flow 1207 bbls, 1-in, 10,000 gals acid, Ellenburger perf 8957-9020 ft, td 9092 ft.

Winkler County—Emperor: Skelly's Halley 66, ne ne sw PSL 13, blk B-12, flow 562 bbls, ½-in, shot 260 qts 2750-2880 ft.

Yoakum County—Wasson: Humble's Randall 25, c nw ne sec 833, flow 443 bbls, ½-in, 7000 gals acid, perf 5000-5105 ft, td 5115 ft.

WEST TEXAS WELL DEEPENED

Ward County: Humble's Richter 20, H&TC 27, blk 34, otd 2925 ft, pump 45 bbls, 2975-3025 ft.

WEST TEXAS WILDCATS

Fisher County—Failure: Northern Ordnance's Green 1, c ne sw H&TC 286, blk 2, elev 1822 ft, Saddle Creek 3535 ft, Noodle Creek 3320 ft, abnd 4227 ft.

Hale County—Failure: Amerada's Kurfees 1, c nw nw H&OB Ry. 6, blk N, elev 3308 ft, anhydrite 1140 ft, salt 1210 ft, San Andres 2440 ft, San Angelo 3730 ft, Canyon 5860 ft, Strawn 6480 ft, Mississippi-granite wash contact 10,093 ft, granite 10,225 ft, abnd 10,250 ft.

Howard County—Discovery: John B. Hawley, Jr.-Northern Ordnance's Cook 1, c se nw T&P 23, blk 34, T-1-N, elev 2496 ft, anhydrite 970 ft, salt 1130 ft, Yates sand 1750 ft, San Andres 3045 ft, pump 13 bbls oil, 7 wtr, shot 750 qts, 3193-3290 ft, td 3516 ft, pb 3300 ft.

Pecos County—Failure: Standard of Texas' Trees 1, near c ne sw H&GN 27, blk 8, elev 2555 ft, hit cavity, abnd 3395 ft.

Schleicher County—Failure: Phillips' Callan 1, c nw nw sec 311, J. E. Wilhelm sur, elev 2306 ft, top Permian 310 ft, Ellenburger 4600 ft, Cambrian (est) 5300 ft, abnd in granite 6065 ft.

WEST CENTRAL TEXAS

Brown County: Guy L. Jones et al's Jones 1-B, 375 ft fr nwl 4700 ft fr nel H. Kraber sur No. 19, 1,450,000 gas, Marble Falls sand 1470-82 ft, td 1525 ft.

Eastland County: North American Oil Con.'s Hodges 1, 660 ft fr ne & nwl 225-ac tr, Francis Blundell sur A-10, Ellenburger 3985 ft, abnd 4091 ft.

Jones County—Roark-Noodle: R. H. Roark et al's Eoff-Humble 2, 1265 ft nsl 330 ft ewl 150-ac tr, T&P 40, blk 18, Hope 2728 ft, Swastika 2975 ft, flow 251 bbls ½-in natural, sand 2976-81 ft.

Shackelford County: Lee & Keys' Diller 20, 150 ft out se cor sw E. T. Ry. sec 15, pump 2 bbls, 517-27 ft.

Lee & Keys' Diller 5-B, 180 ft nsl 165 ft ewl se E. T. Ry. 15, blk 10, pump 5 bbls, 508-20 ft.

Phillips' Buford 1, 1948 ft snl 2000 ft ewl B. A. L. sec 29, elev 1355 ft, Bend 3428 ft, Ellenburger 4356 ft, abnd 4504 ft.

Roeser-Pendleton-Continental's Cook 14-A-118, 1698 ft wel 345 ft nsl ne E. T. Ry. sec 118, abnd 1688 ft.

WEST CENTRAL TEXAS WILDCATS

Coleman County—Failures: Phillips' Ballard 1, 3804 ft wel 4235 ft nsl, D. W. Cloud sur No. 713, elev 1799 ft, Morris sand 2411-30 ft, Bend 3303 ft, Barnett 3570 ft, Mississippi 3660 ft, Ellenburger 3667 ft, abnd 3720 ft.

Auto Ordnance-Sohio's Morris 1, 467 ft out nw cor 320-ac tr, W. B. Roddan sur No. 4, elev 1993 ft, Morris sand 3341 ft, Upper Frey 3407 ft, abnd 3858 ft.

Mills County—Failure: J. Garfield Buell et al's Barnes & McCullough 1, 2640 ft out nw cor E. T. Ry. sec 3, Marble Falls 3418 ft, abnd 3518 ft.

Shackelford County—Failure: Roeser-Pendleton-Continental's Cook 2-A-145, 399 ft nsl 1533 ft wel ne E. T. Ry. sec 145, elev 1819 ft, Palo Pinto 3131 ft, abnd 3560 ft.

SOUTHWEST TEXAS

Duval County—Sejita: Standard of Texas' Alliance Trust 1, 330 ft fr el 467 ft fr nl lot 2, blk 27, Copita F&G Tr, San Pedro de Charco Redondo Gr, 100-ac lse, 5½-in 5845 ft, perf 5800-24 ft, flow 75 bbls, ⅛-in, td 5845 ft.

Starr County—Cameron: Ralph E. Fair's Guerra 1, 660 ft fr se&swl 1900-ac lse, Juan Garcia Chapa sur 362, abnd 4020 ft.

Stanolind's Lyons 2, 330 ft fr n&wl GB& CGNG sur 225, 160-ac lse, 5½-in 4265 ft, 108 bbls, 3/16-in, td 4755 ft.

GULFCO WAR WORK COMES FIRST

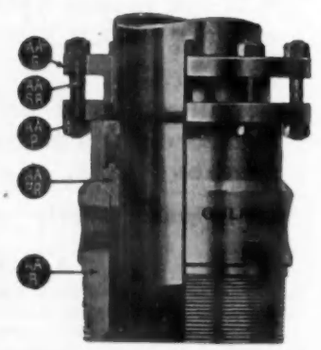
However we are still giving good service to our customers, especially to those who give us 4 or 5 days notice

GULFCO FORGED STEEL CASING HEADS

TYPE AA—2000 lbs., 4000 lbs., 6000 lbs., Test Pressures

This head is used where there is a possibility of a blowout while setting the bottom hole string of casing. The lower packing and packing rings are of one piece construction and are latched around the pipe and set as a unit. At the first sign of a blowout this packer can be set.

GULFCO FORGED STEEL FOR SAFETY



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24 Years Manufacturing Forged Steel Fittings
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SOUTHWEST TEXAS WILDCATS

Duval County—Failures: American Republics' Reyes 1, 3 mi w Bridwell field, 165-ac lse, Andres Reyes sur 4, abnd 4231 ft.

M. E. Davis' Southland Life Insurance 1, 643-ac lse, Santos Flores Gr, abnd 4918 ft.

Taylor Refining Co.'s Sepulveda 1-C, 320-ac lse, 1½ mi n Cadena field, R. Sepulveda Gr, abnd 5146 ft.

SOUTH CENTRAL TEXAS

Bastrop County—Hilbig: Marts & Beaven's Goerta 1, 97-ac lse, Andrew Mays sur 19, 1 mi ne Rockne, abnd 2661 ft.

LOWER TEXAS COAST

Bee County—West Cosden: H. B. Zachry Co.'s Brown 2, 451-ac lse, 1200 ft ne Brown 1, T. J. Butler sur, abnd 3965 ft.

DeWitt County—Slick-Wilcox: Barnsdall's Riedel 1, 330 ft fr sel 590 ft nel 80-ac lse, Marcus Sewell sur 8, 7-in 7642 ft, perf 7626-40 ft, 270 bbls, 5/32-in, td 7642 ft.

Jackson County — West Ganado: Pure's Wiese 4, 521 ft fr ne&swl 130-ac lse, William Menefee sur, e flank, 5½-in 4765 ft, perf 4738-62 ft, 76 bbls, 3/32-in, td 4765 ft.

Jackson County—West Ranch: Mid-Continent Petroleum's Simons & Seidel 1, 467 ft fr s&wl 40-ac lse, R. Musquez 5½-Lge Gr, 5½-in 5777 ft, perf 5736-39 ft, 314 bbls, 3/16-in, td 5789 ft.

Jim Wells County—North Magnolia City: Humble's Longoria 1, 660 ft fr n&el of e½ s½ lot 6, Adams-Staples subdvn, Jose Pacheco Gr, abnd 5365 ft.

Edwin M. Jones' Evetts 5, 558 ft fr sl 780 ft fr el of n 255-ac tr 3, Roberts & White subdvn of McIntyre tr, Marcelino Lopez Gr, abnd 5510 ft.

Jim Wells County—Seeligson: The Ramsey Petroleum Co.'s Bramhal 1, 520 ft fr el 660 ft fr nl lot 2, 60-ac lse, Haldeman subdvn, Seeligson Rch, Richard Ross sur, dual comp, 5½-in 5969 ft, perf 5913-25 ft, 158 bbls, 7/64-in; perf 4885-95 ft, 102 bbls, ⅛-in, td 5969 ft.

Sun's Canales 26, 3180 ft fr most e ly nl 3000-ac lse, A. Canales sur 64, 5½-in 6000 ft, dual comp, perf 5202-10 ft, 81 bbls, ⅛-in; perf 5948-56 ft, 139 bbls, ⅛-in, td 6000 ft.

Jim Wells County — Stratton: Chicago Corp.'s Wardner 42, 714 ft fr wl 2727 ft fr nl sec 3, Charles Stratton subdvn, Paso Ancho de Arriba Gr, 8782-ac lse, nw flank, 5½-in 7197 ft, perf 7133-65 ft, flow 32,000,000 gas open, shut in, td 7197 ft.

Kleberg County—Seeligson: Humble's King Ranch-Cabeza 25, 660 ft fr wl 2480 ft fr sl GH&H sur 47, 6420-ac lse, n flank, 5½-in 5250 ft, perf 5231-36 ft, 102 bbls, ⅛-in, td 5250 ft.

Kleberg County—Stratton: Humble's King Ranch-Paso Ancho 35, 660 ft fr nl 4750 ft fr el Santa Gertrudis Gr, 6350-ac lse, 5½-in 6650 ft, perf 6591-6600 ft, 115 bbls, ¼-in, td 7225 ft.

Nueces County — Richard King: Southern Minerals' Richard King 30, 2250 ft fr wl 3100 ft fr sl sec 32, 5971-ac lse, 5½-in 5610 ft, perf 5604-09 ft, 66 bbls, 7/64-in, td 5610 ft.

San Patricio County—Taft: Humble's Mayo 36, 467 ft fr wl 1980 ft fr nl 220-ac lse, J. H. W. Ottman sur, 5½-in 4910 ft, perf 4906-10 ft, 79 bbls, ⅜-in, td 4910 ft.

Willacy County—Willamar: J. B. Stoddard's Cavazos 1, 467 ft fr e&wl 705 ft fr sl 45-ac tr, share 7, San Juan de Carricitos Gr, 5½-in 7945 ft, perf 7924-43 ft, 238 bbls, 3/16-in, td 7969 ft.

LOWER TEXAS COAST WILDCATS

DeWitt County—Failure: H. B. Zachry Co.'s Rath 1, Thomaston area, 48-ac lse Green DeWitt Lge, 6 mi se Cuero, abnd 10,018 ft.

Goliad County — Failure: Guy E. Green's Huggins 1, 4200 ft fr most s'ly nl 6630 ft fr most w'ly wl 5049-ac lse, Maria de Jesus Ybarbo Gr, 4 mi e Goliad, abnd 4231 ft.

Live Oak County—Failure: Henderson Coquat's Brewer 1, 660 ft wsw, th 1322 ft ese fr ne cor W. L. Brewer lands, 4 mi sw Whitsett, abnd 6000 ft.

San Patricio County—Discovery: Texas Conservative Oil Co.'s Gaines 1-A, 660 ft fr nw&swl blk 22, 160-ac lse, W. G. Burgess sur, 5½-in 5700 ft, perf 5430-36 ft, 91 bbls, ¼-in, td 7225 ft.

TEXAS GULF COAST

Jefferson County—Lovell Lake: Humble's Broussard 48, 4593 ft s alg el of 1853-ac lse, C. Hillebrandt sur, 5½-in 7800 ft, perf 7719-26 ft, 135 bbls, ⅛-in, td 7810 ft.

Montgomery County—Lake Creek: Superior's Frost 3, 1200 ft n 660 ft e of se cor lot 7, 1896-ac lse, A. Hodge sur, 7⅝-in 11,682 ft, perf 11,570-584 ft, flow 195 bbls, 16/64-in, td 11,682 ft.

TEXAS GULF COAST WILDCATS

Colorado County—Discovery: Ohio Oil Co.'s McDermott 1, 695-ac lse, AB&M sur, 6 mi sw Garwood, 5½-in 6853 ft, perf 6510-6520 ft, flow 98 bbls 52.2-gr cond, 9,850,000 gas, ½-in, td 7087 ft. Opens Cockfield sand field.

Jefferson County—Failure: Northern Ordnance's Hinkle 1, Stowell area, 160-ac lse, sec 156, e of Stowall field, abnd 9515 ft.

EAST TEXAS WILDCATS

Hopkins County—Failure: J. C. Benedum et al's Spencer 1, 715 ft nsl 665 ft ewl of 65-ac tr, John O. Holbert sur, elev 441 ft, Woodbine 3840 ft, Georgetown 4505 ft, Goodland 5295 ft, Paluxy 5450 ft, massive anhydrite 6685-6822 ft, Travis Peak 7248 ft, abnd 7500 ft.

Hunt County—Failures: Humble's Norman 1, 670 ft snl 3300 ft wel, Hiram Thompson sur, elev 559 ft, Woodbine 2007 ft, Georgetown 2782 ft, massive anhydrite 4310-4573 ft, Buckner 6612 ft, Smackover 6885 ft, Eagle Mills 7020 ft, abnd in schist 7157 ft.

Sohio's Hoff 1, 2100 ft ewl 2450 ft nsl, Wiley A. Mattox sur, elev 534 ft, Pecan 642 ft, base Austin 2067 ft, Woodbine 2573 ft, abnd 3070 ft.

Nacogdoches County—Failure: Texas Co.'s Pruitt 1, 330 ft snl 1300 ft wel 150-ac lse, M. J. Ariola sur, elev 365 ft, Austin 4590-4663 ft, Georgetown 4660 ft, Goodland 5056 ft, Paluxy 5320 ft, massive anhydrite 6918-7153 ft, James 7642 ft, Pettit 7898 ft, Travis Peak 8524 ft, abnd 8844 ft.

Smith County—Chapel Hill: Chapel Hill Gas System's Caldwell-Hughes-Allen 1, 207 ft ewl and 1527 ft nsl 81.87-ac tr, F. Ariola sur, elev 428 ft, flow 199 bbls, 9/64-in, natural, Pettit perf 8190-8270 ft, td 8321 ft.

Wood County—Hawkins: Humble's Stringfellow 1, 1400 ft wel 4600 ft nsl, E. Wideman sur, pump 244 bbls, perf 4700-4812 ft, td 4850 ft.

NORTH TEXAS

Archer County: J. A. McCarty-J. P. Coleman's Taylor 7-A, 413 ft snl 300 ft wel lot 13, ATNCL sec 17, pump 110 bbls, sand 1444-52 ft, td 1457 ft.

Archer County—Vogtsberger: Shell's Thorman 2, 1787 ft snl 853 ft ewl e½ H&TC 11, blk 1, flow 326 bbls, 2-in, shot 15 qts 4680-95, 20 qts 4706-26 ft, td 4760 ft.

Clay County—Stephens: Continental-W. R. Omohundro's Stephens 1-A, 2044 ft snl 3380 ft wel, G. W. Tipps sur, elev 981 ft, abnd 6240 ft.

Clay County—Joy: Shell's Scaling 2, 330 ft snl 2949 ft ewl blk 15, H. Williams sur,

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UNITED STATES WELL COMPLETIONS

Bend 5411 ft, Miss 6034 ft, Ellen 6188 ft, pump 80 bbls, shot 15 qts 3967-97 ft, td 6192 ft, pb 4057 ft.

Jack County—Weir: Continental's Weir 2, 1650 ft nsl 330 ft wel, G. Kaltrider sur, pump 34 bbls, Strawn 2346-52 ft.

Cooke County—Walnut Bend: Carter-Gragg Oil Co.'s Ramsey-Ohio 3, 1320 ft ewl 660 ft nsl of e-273 ac, C. Furinash sur, top Snuggs 4917 ft, Winger 5543 ft, flow 648 bbls, 2-in, perf 5543-63, 5571-84 ft, td 5594 ft.

Montague County—Hildreth: Sinclair Prairie's Middleton 4, 1104 ft snl 330 ft ewl e-158-ac w-222 ac of s½ E. T. Ry. sec 53, Bend 6011 ft, Barnett 6313 ft, flow 2345 bbls, 2½-in, perf 6050-6101 ft, td 6327 ft.

Throckmorton County: Grisham-Hunter Corp.'s Kelly 1-C, 1000 ft wel 1400 ft nsl, J. LeBleau sur A-902, abnd 800 ft.

Young County: Kerlyn Oil Co.-Phillips' Holt 1, 4250 ft snl 527 ft ewl, S. Sallie sur A-252, Bend 4355 ft, Barnett 5121 ft, Miss 5158 ft, flow 1068 bbls, 26/64-in, 500 gals acid perf 5208-16 ft, td 5220 ft.

Northern Ordnance-Blair and Jas. Baker's B. W. King 1, 467 ft out nw cor S. P. Ry. sec 9, A-263, abnd 3702 ft.

NORTH TEXAS WELL DEEPENED

Archer County—Chalk Hill: Deep Oil Dev. Co.'s Wilson 3, ATNCL sec 119, otd 2219 ft, pump 5 bbls, td 2255 ft.

NORTH TEXAS WATER DISPOSAL WELL

Young County: Magnolia's Schlegel 9, 863 ft snl 428 ft wel of s-100 of w-140 of e½ BBB&C sec 1, sand 1409-44 ft.

NORTH TEXAS WILDCATS

Clay County—Failure: Premier Oil Ref. Co.-Joe A. Humphrey's Wines 1, 467 ft out sw cor lot 5, J. J. Hand sur, A-175, Bend 5710 ft, Barnett shale 6135 ft, abnd 6324 ft.

Cooke County—Discovery: Sinclair Prairie's Montgomery 1, 3415 ft snl 330 ft ewl, Robt. Finley sur A-389, elev 758 ft, flow 1212 bbls 40.8-gr, natural, 760/1, 1½-in, Strawn sand 5112-31 ft, td 5137 ft.

Haskell County—Failure: Hunter & Hunter-Sohio Pet. Co.'s Hughes 1, 1830 ft fr m/s/sl 4900 ft fr m/w/el, M. Travieso sur No. 38, A-337, Palo Pinto 3278 ft, abnd 3342 ft.

Jack County—Failures: Standard of Texas-Hanlon & Buchanan's T. M. Jackson 1, 347 ft fr sel 880 ft fr swl, J. Crowley sur A-1602, abnd 3915 ft.

Young County—Failure: Northern Ordnance's Horton-Davis 1, 330 ft out sw cor TE&L Co. sec 1905, Mississippi 5158 ft, abnd 5384 ft.

TEXAS PANHANDLE

Carson County: Skelly's Schafer 177, 440 ft nsl 1320 ft wel ne I&GN 196, blk 3, pump 248 bbls, shot 367 qts 3086-3156 ft.

Gray County: Magnolia's Darsey-Magnolia 5, se se ne ACH&B 26, blk 1, pump 44 bbls oil, 18 bbls wtr, shot 480 qts 2940-3044 ft.

Phillips' M. Davidson 7, nw sw sw H&GN 86, blk B-2, pump 76 bbls, 3102-35 ft.

Wilcox O & G Co.'s Combs-Worley 53, se nw ne I&GN 60, blk 3, pump 17 bbls oil, 20 bbls wtr, shot 520 qts 2795-2939 ft, td 2954 ft.

United States Wildcat Starts

ARKANSAS

Ashley County: Union Prod. Co.'s Crossett Lumber Co. D-2, e nw nw 3-18-9, lcn 7000-ft test.

Union County: Curtis Kinard's A. C. Gaddy Est. A-1, e nw ne ne 14-17-14, lcn.

Curtis Kinard's P. W. Gaddy 1, c sw sw sw 12-17-14, lcn.

CALIFORNIA

Kern County: Grandell Oil Co.'s 6, se se se 10-27-27, Poso Creek area, lcn.

Pacific Western Corp.'s Enas Fee 35A, nw ne sw 21-27-27, Poso Creek area, dr 2120 ft.

Standard's 6-6, 2634 ft due w fr e¼c 29-2929, Kern Bluff area, lcn.

Union's Kernco 88-8, se se se 8-29-25, Rio Bravo area, mim.

Los Angeles County: Gilco's 1, 100 ft n 65 ft w nwc intersec P. E. Ry. r/w and Flood Control, Seal Beach area, lcn.

Santa Barbara County: J. I. Anderson-Southern Calif. Pet. Corp.'s Archambeault 1, nw sw 3-7-32, Los Alamos area, bldg rig.

ILLINOIS

Clinton County: J. L. May's Gross 1, ne se ne 31-2n-2w, lcn.

Cole County: H. V. Daugherty & F. M. Morgan's M. Reinhart 1, se ne se 29-12n-8e, lcn.

Cumberland County: F. D. Walker et al's F. P. Shields 1, se se se 21-10n-8e, lcn.

Fayette County: Texas' Howard-Whitford 1, se se sw 27-5n-4e, lcn.

Jefferson County: Texas' N. Cowger 1, nw nw nw 11-3s-3e, lcn.

Marion County: Texas' C. Hiestand 1, se se se 16-3n-3e, lcn.

Shelby County: C. E. Stout et al's W. McAndrews 1, sw ne 26-10n-6e, lcn.

St. Clair County: C. W. Young's McCurdy 3, 255 ft n of c of nw nw nw 32-3s-6w, dr.

White County: Big Chief Drlg. Co.'s Martin 1, e½ ne nw 34-3s-8e, lcn.

E. J. Kubat's Strum 1, n½ ne ne 14-4s-10e, dr.

KANSAS

Barton County: Mineral Products Co.'s A. H. Reif 1, nw nw sw 30-16s-12w, Topeka 2703 ft, Lans 3157 ft, Anhy 853 ft, sso 3167-58 ft, Base K. C. 3394 ft, td 3403 ft, wod.

Ellis County: Darby, Continental-Cities Service's Kansas Frontier State Park 1, nw se 5-14s-18w, rur.

Ellsworth County: Phillips' Klema 1, nw nw ne 5-14s-10w, dr 499 ft.

Harvey County: F. G. Holl's Lagree 1, nw nw se 9-23s-3w, Miss 3262 ft, acid total 3500 ft, rup.

Marion County: Sohio Pet. Co.'s Voth 1, sw se 9-21s-1e, lcn.

Westgate-Greenland's Eilers 1, c e½ sw se 15-17s-1e, mim.

Rooks County: Sunray's Federal Land Bank 1, se 20-6s-19w, rur.

Russell County: Bridgeport's Beisel 1, sw nw 15-14s-12w, lcn.

Stafford County: Shell's J. Rugen "A" 1, se nw 4-21s-11w, c&p.

Isern Bros.' Lanterman 1, nw ne se 11-21s-12w, Anhy 595 ft, dr 775 ft.

KENTUCKY

Daviess County: W. E. Hupp's Mrs. Hartley Reno 1, nw nw se 14-Q-27, lcn.

Miller & Shiarella's C. R. Simmons 1, 1200 ft nl 50 ft w of farm div line, 11-O-27, dr.

Henderson County: Great Lakes Carbon's O. W. Rash Heirs 1, 10,870 ft nl 1100 ft wl 6-P-27, dr.

McLean County: Sohio's W. N. Short Heirs 1, ne nw nw 6-M-27, lcn.

Webster County: Cherry & Kidd's Robt. Cates 1, se¼ 2-L-23, lcn.

MICHIGAN

Gratiot County: C. W. Teater's Church 1, ne sw ne 9-12n-3w, rig.

Isabella County: Chartiers Oil Co.'s Stalter 1, s½ se se 18-13n-3w, lcn.

L. T. Barber's Cairl 1, se se sw 33-13n-6w, rig.

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"According to our records, your valves require approximately 90% less maintenance expense than any other mud valve we have ever used. To date, all of our rigs are completely equipped with "Flex-Seal" valves . . . "

CRON & GRACEY DRILLING CORPORATION

"As to the saving in maintenance cost which we have made by installing Flex-Seal valves, we find it difficult to arrive at a definite figure but can assure you that the saving is substantial."

J. S. ABERCROMBIE COMPANY

"Our maintenance expense for Cameron Flex-Seal Mud Valves in service in the Old Ocean field averaged approximately 4c per valve per thousand feet of hole drilled."

ALLEN & MORRIS
Drilling Contractors

"It would be difficult for us to determine the exact maintenance cost on our Flex-Seal mud valves, but we do know that this cost is extremely low compared to the maintenance cost of ordinary mud valves."

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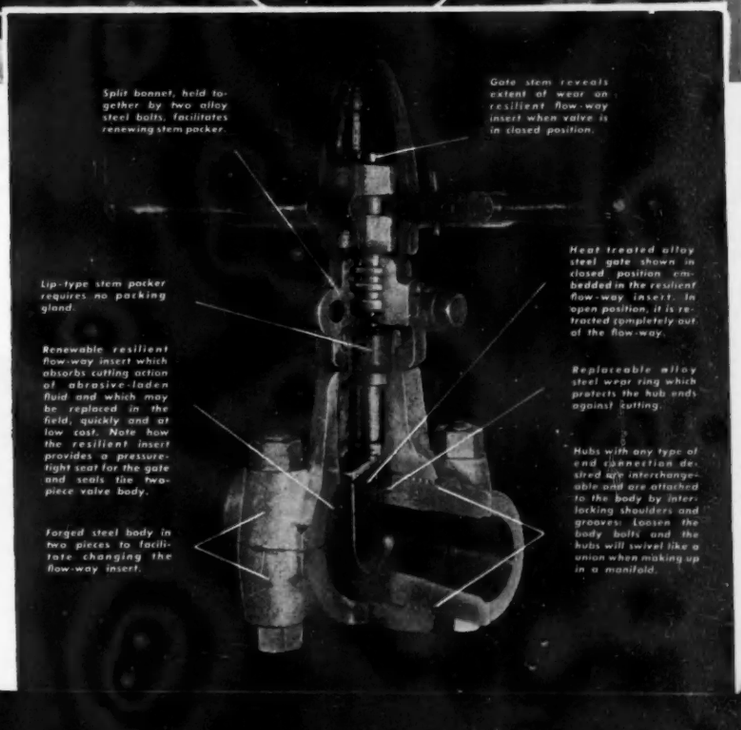
Split bonnet, held together by two alloy steel bolts, facilitates renewing stem packer.
Gate stem reveals extent of wear on resilient flow-way insert when valve is in closed position.
Lip-type stem packer requires no packing gland.
Heat treated alloy steel gate shown in closed position embedded in the resilient flow-way insert. In open position, it is retracted completely out of the flow-way.
Renewable resilient flow-way insert which absorbs cutting action of abrasive-laden fluid and which may be replaced in the field, quickly and at low cost. Note how the resilient insert provides a pressure-tight seat for the gate and seals the two-piece valve body.
Replaceable alloy steel wear ring which protects the hub ends against cutting.
Hubs with any type of end connection desired are interchangeable and are attached to the body by interlocking shoulders and grooves. Loosen the body bolts and the hubs will swivel like a union when making up in a manifold.
Forged steel body in two pieces to facilitate changing the flow-way insert.

Of equal importance to the extremely low maintenance cost of Cameron Flex-Seal Mud Line Valves is the dependable seal which it provides. Note in the cut-away view at right the generous reserve of resilient gate packer material, or flow-way insert, and the gate stem which reveals the extent of wear on the gate packer when in closed position. Thus, the valve may be easily kept in efficient sealing condition at all times. When repairs are needed they may be made at the rig with ordinary tools by any member of the drilling crew . . . quickly and easily.

Complete details on 2000, 4000 and 6000-lb. test Cameron Flex-Seal Mud Line Valves are carried in your Composite Catalog, or literature will gladly be sent on request.

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Export: 74 Trinity Place, New York, N. Y. *California:* The Howard Supply Co., Los Angeles. *Rocky Mountain:* Mountain Sales & Service, Casper, Wyoming.

Mecosta County: E. V. Hilliard's Consumers 1, 8½ sw nw 8-16n-9w, dr.
Newago County: Central Dev. Co.'s Jewell 1, e½ se sw 25-16n-14w, dk.
Tuscola County: Wicklund Dev. Co.'s Carolan 1, n½ se ne 9-14n-10e, lcn.

NEW MEXICO

Lea County: Magnolia's State 1-U, c sw sw 10-11s-35e, lcn.

OKLAHOMA

Cleveland County: Mid-Continent's E. P. Westermier 1, ne sw sw 26-10n-3w, lcn.
Creek County: J. Garfield Buell's Davidson 1, ne ne ne 2-14n-9e, c&p.
Lincoln County: (OWDD) Wilcox Oil & Gas' DeLozier 1, sw sw sw 10-14n-6e, otd 3155 ft, pg 3323 ft.
Logan County: Texas Co.'s Tilmon 1, nw nw se 27-17n-1e, lcn.
Oklahoma County: Atlantic Refg. Co.'s Harter 1, se nw nw 25-11n-1e, lcn.

WEST TEXAS

Andrews County: N. G. Penrose's Parker 1, 2640 ft ewl 152 ft nsl sec 111, blk P, J. Hobelis sur, lcn 7600-ft for Mascho field.
Pecos County: Standard of Texas' Trees 1-a, c nw se H&GN 27, blk 8, mim.
Runnels County: Elliott and Matheison's Giesecke 1, 4740 ft snl 1124 ft wel James Hughes sur No. 227, lcn 3500-ft test.
Terry County: N. G. Penrose's J. M. Moore 1, c nw nw D&W 82, blk T, lcn 6500-ft test.

WEST CENTRAL TEXAS

Shackelford County: W. K. Wood et al's E. T. Simpson 1, 150 ft out ne cor s½ nw Blind Asylum Lands sec 13, lcn.
Taylor County: Humble's Wm. Nolte 1, 660 ft out sw cor 167-ac lse, tract 28, lge 121, Guadalupe CSL sur, lcn.

LOWER TEXAS COAST

Bee County: H. F. Wilcox Oil and Gas Co.'s Burrows 1, 160-ac lse, James Jones sur, 9 mi w Beeville, lcn 5000-ft test.
Hidalgo County: Baldridge-King-Nichols-Sohlo's King 1, 653 ft fr wl 5747 ft fr sl 720-ac lse out of sw cor of w 3200-ac, Los Indios tract 9, San Salvador del Tule Gr, lcn 9000-ft test.
Live Oak County: Freeman P. Galt's Brookshire 1, 1920-ac lse, HT&B sur 1, 3½ mi sw Clegg, lcn 4000-ft test.

SOUTHWEST TEXAS

Jim Hogg County: Arkansas Fuel's Spoonts 1, 8944 ft fr nl 10,930 ft fr wl 10,512-ac lse, Jose Manuel Ramirez Gr, 4 mi se Weil field, lcn.
Zapata County: Gilcrease Oil Co.'s Cuellar 1, 640-ac lse, sur 248, 20 mi s Mirando City, lcn 1500-ft test.

SOUTH CENTRAL TEXAS

Dimmitt County: Robert Wheeler's Patchernick 1, 648-ac lse, I&GN sur 2, blk 5, 1½ mi ne Valley Mills, lcn 5500-ft test.
Gonzales County: J. L. Collins & Co.'s Bowers 1, 190-ac lse, James Gibson Lge, 4½ mi se Waelder, lcn 4800-ft test.

TEXAS GULF COAST

Brazoria County: Skelly's Shepard 1, 44-ac unit sec 22, E. Little sur, 8 mi n of Manvel, lcn 8500-ft test.
Colorado County: Northern Ordnance's Ammann 1, 150-ac lse, I&GN sur 2, 6 mi sw Garwood, lcn 9500-ft test.
Grimes County: Northern Ordnance's Quinn 1, 1080-ac lse, S. F. Austin sur, blk 17, 9 mi se Navasota, lcn 8000-ft test.
Hardin County: American Republics-Houston Oil's Sternenberg & Co. 1, 579-ac lse, H&TC sur, 8 mi e Village Mills, lcn 7750-ft test.
Matagorda County: Skelly's Norris 1-B, 348-ac lse, I&GN sur 5, 4½ mi n Bay City, lcn 8500-ft test.
Newton County: Gulf's Kirby Lumber 1-A, 2½ mi s of Call, lcn 10,000-ft test.

EAST TEXAS

Navarro County: F. W. Willson et al's A. A. Sheppard 1, 1934 ft fr swl 330 ft fr nwl E. P. Gaines (Chism) sur, 1 mi ne Frost, lcn.
Red River County: Oscar Donley, tr's R. G. Mitchell 1, 1900 ft snl 250 ft wel, A. J. Witt sur, lcn 2200-ft test.
Smith County: Bobby Manziel et al's J. L. Morrison 1, 660 ft snl 1520 ft ewl, S. J. Lott sur, 3 mi nw Friendship, mim Paluxy test.
Texas Co.'s Lelia Nix 1, 330 ft ewl 380 ft nsl tr and Nimrod Doyle sur, 3 mi se Starville, lcn Travis Peak test.

NORTH TEXAS

Archer County: Carl Childs et al's J. A. Bell 1, 200 ft snl 600 ft wel sec 14, blk 5, Clark-Plumb sur, lcn 1200-ft test.
Clay County: Nixon Pet. Co.'s J. B. Wells 1, 200 ft ewl 200 ft fr nwl blk 32, Bacon sur, lcn.
Sussex Oil Corp.'s H. W. Perkins 1, 200 ft snl 1050 ft wel blk 79, Byers sur, lcn 1200-ft test.
Wichita County: Bridwell Oil Co.'s Joe Bridwell 2, 300 ft snl 200 ft wel AB&M sur A-595, lcn 2000-ft test.
Oscar Donley, tr's Mrs. J. L. Bostic 1, 850 ft snl 330 ft ewl lot 3, Henry Hastie sur A-98, lcn 1600-ft test.

Liquefied Gas Shortage Depends on Tank Cars

A current nation-wide difficulty in obtaining liquefied petroleum gases is but a temporary one and will be corrected as soon as the specially constructed tank cars used to haul these gases can be returned to their normal service, it was assured January 24 by Administrator Ickes.

There is no over-all shortage of the products, Ickes emphasized, and the situation is due to transportation, which is particularly affected by changes in distribution patterns and the seasonal peak in demand. In recent months, he explained, it has been necessary to divert many of the specially constructed tank cars to emergency movement of raw materials for synthetic rubber and aviation gasoline.

"How long this shortage of transportation will last is not definitely known," Ickes said. "It is hoped that in the near future enough cars will be returned to this petroleum service so that more normal delivery services can be resumed by the distributors."

☆

JOSEPH M. BARBER, JR., has been promoted to district chief clerk for Humble Oil & Refining Company, at the Heyser Gasoline Plant, Bloomington, Texas. He was formerly employed in the natural gas department in Southwest Texas.

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AMERICAN SUPER HEAVY DUTY BEARINGS are designed especially for strenuous, gruelling, around-the-clock service. Their simple construction, absolute precision and tremendous strength assure longer, safer, lower-cost, trouble-free performance under the most adverse service conditions. Consult our engineering department for full technical details. Write TODAY!

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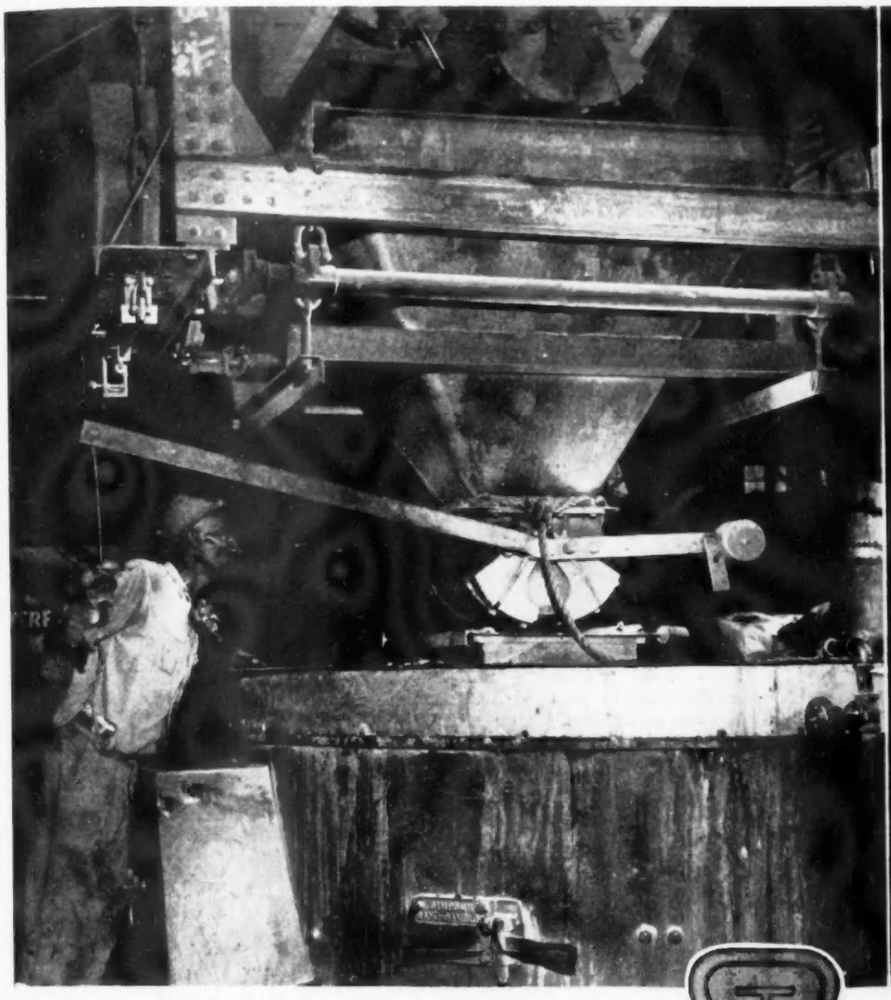


SAND TESTING To Assure UNIFORMITY

Sand testing is the start of the finish in steel castings. Scientific preparation of sand is as important as metallurgical control of the steel that goes into the mould . . . because, without proper preparation of the sand from which the mould is made, the finest steel cannot produce a desirable finish on the casting.

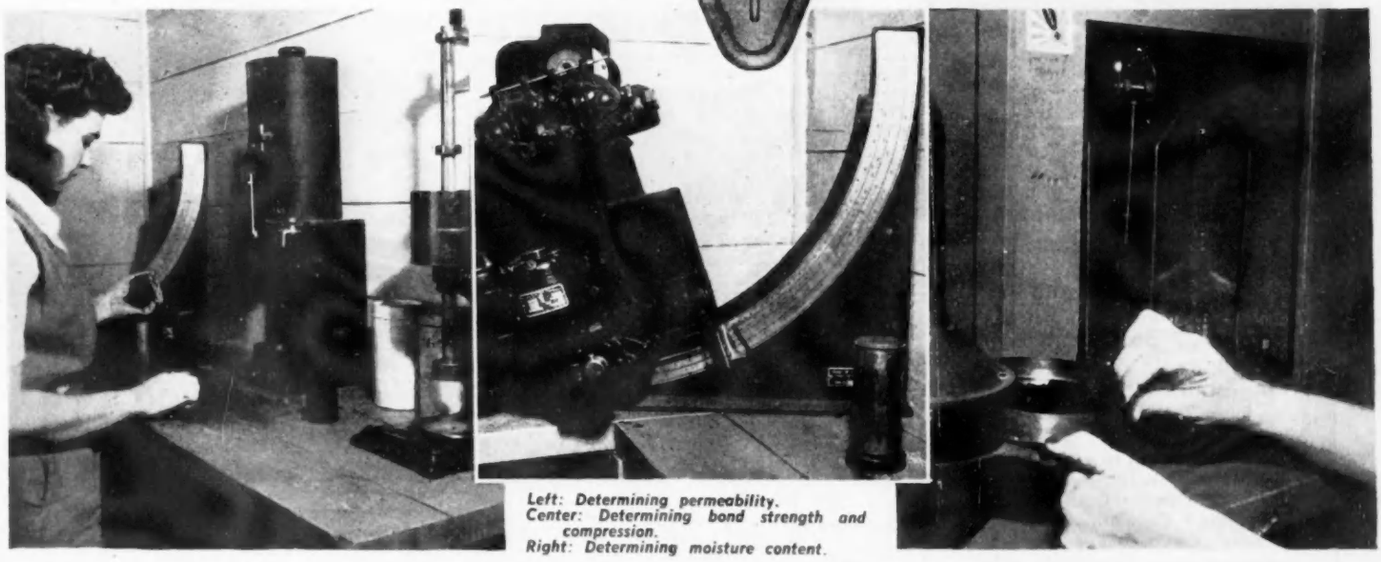
Each batch of moulding sand is accurately weighed, both the sand and the ingredients. This then is carefully milled, after which it is tested for permeability, bond strength, compression, and moisture content.

The above factors play an extremely important role in the development of high quality TESCO steel castings.

TEXAS ELECTRIC STEEL CASTING CO.

GOOD CASTINGS TESCO HOUSTON, TEXAS

Above Weighing the batch in the Mueller.



Left: Determining permeability.
Center: Determining bond strength and compression.
Right: Determining moisture content.

The TESCO Hallmark is the symbol of Quality in industry today

TESCO

BETTER STEEL FOR MODERN INDUSTRY

GEOPHYSICAL TRANSFORMERS

sealed against Sub tropical humidity—"Sextuplex shielding," improved uniformity, minimum size and weight, *plug-in terminal block.

* *Also available with terminal lugs.*

GEOPHONE CABLE

Full line of Geophysical electronic supplies.

HARRISON EQUIPMENT COMPANY
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HOUSTON • TEXAS
ELECTRONIC • OIL EXPLORATION • SUPPLIES

Oil was never more important than now. Get more of it from old pumpers by calling for Cavins Screen Cleaning Service. Let CAVINS CLEAN THEM OUT!

THE CAVINS CORP.
HOUSTON, TEXAS
CAVINS
OIL WELL CLEANOUT TOOLS

Scale-Ex Compound
liquid or paste . . . for Equipment Maintenance

A new approach to *water treating problems* for: Refineries • Recycling Plants • Gasoline Plants • Boilers • Circulating Systems • Towers • Condensers . . . all equipment requiring scientific water treatment.

PROOF: Fourteen years development on a new idea that is saving time, money, and trouble for leading companies.

Write . . . Wire . . . Phone

CHEMICAL COMPOUND CO.
2911 RUSK AVE. P. O. BOX 2222
HOUSTON, TEXAS

Squeaks from the Bull Wheel

When Else?

"I got up at dawn yesterday to see the sun rise."

"You couldn't have chosen a better time."

Doctor Knows

The doctor said I'd be on my feet in a month.

Was he right?

Sure; he knew about my tires.

Explained

"What has become of the locomotive and train of cars I gave you for Christmas?"

"All smashed up. We have been playing government ownership."

Advice

Late one afternoon in December there was a phone call for the editor of the "Ask Me Another" column. A voice asked, "How can I make anti-freeze?"

"Hide her woolen pajamas," he advised.

Her Privilege

A little girl sitting in church watching a wedding, suddenly exclaimed: "Mummy, has the lady changed her mind?"

"Why, what do you mean?" the mother asked.

"Why," replied the child, "she went up the aisle with one man, and came back with another."

Encouraging

First Spinster: "It is true that you are going to be married, Miss Antique?"

Second Ditto: "No; but I am thankful for the rumor."

Shudder

"What color are your window blinds?"

"Window blinds are all shades, madam."

Dictates Letter

"Now look here. I fired three girls for revising my letters, see?" said the boss to his new steno.

"Yes sir."

"All right; now take a letter and take it the way I tell you."

And the next morning Mr. O. J. Squizz of the Squizz Soap company received the following letter:

"Mr. O. K. or A. J. or something, look it up, Squizz, what a name, Soap company, Detroit, that's in Michigan, isn't it? Dear Mr. Squizz. Hmmm. The last shipment of soap you sent us was of inferior quality and I want you to understand—no, scratch that out. I want you to understand—Hmm—unless you can ship—furnish, ship, no furnish us with your regular soap you needn't ship us no more, period, or whatever the grammar is, and pull down your skirt!

"Where was I? Paragraph. Your soap wasn't what you said—I should say it wasn't. Them bums tried to put over a lot of hooey on us. Whadda you want to paint yer faces up for like Indians on the warpath. We're sending back your last shipment tomorrow. Sure, we're gonna send it back. I'd like to feed it to 'em with a spoon an' make 'em eat it, the bums. Now read the letter over—no, don't read it over, we've wasted enough time on them crooks, fix it up and sign my name. What do you say we go out to lunch?"

Explained

What explanation do you have for wandering on the street at this hour of the night?

Shay, offishur, if I had an explanation, I'd have gone home to my wife an hour ago.

Power of Advertising

"We saw the advertisement about this house being for sale and we've come to see it."

"Yes, madam, but after reading the ad writer's description of it we have decided not to sell."

Kid Stuff

"And Harry, what are you going to give your darling little brother for his birthday this year?"

"I dunno," said Harry, "last year I gave him the chicken pox."

Be 100%

with your

10%

★

***Buy* WAR BONDS**

DIESEL
JACKET WATER STABILIZATION

Maintain effective cooling . . . eliminate scale formation . . . prevent pitting and corrosion by stabilizing your Diesel Jacket Water. We offer reliable stabilization by intelligent application of standard methods. Phone, write, wire for further information.

25 Years Successful Experience

GULF ENGINEERING CO., INC.
"Service, Not Promises"
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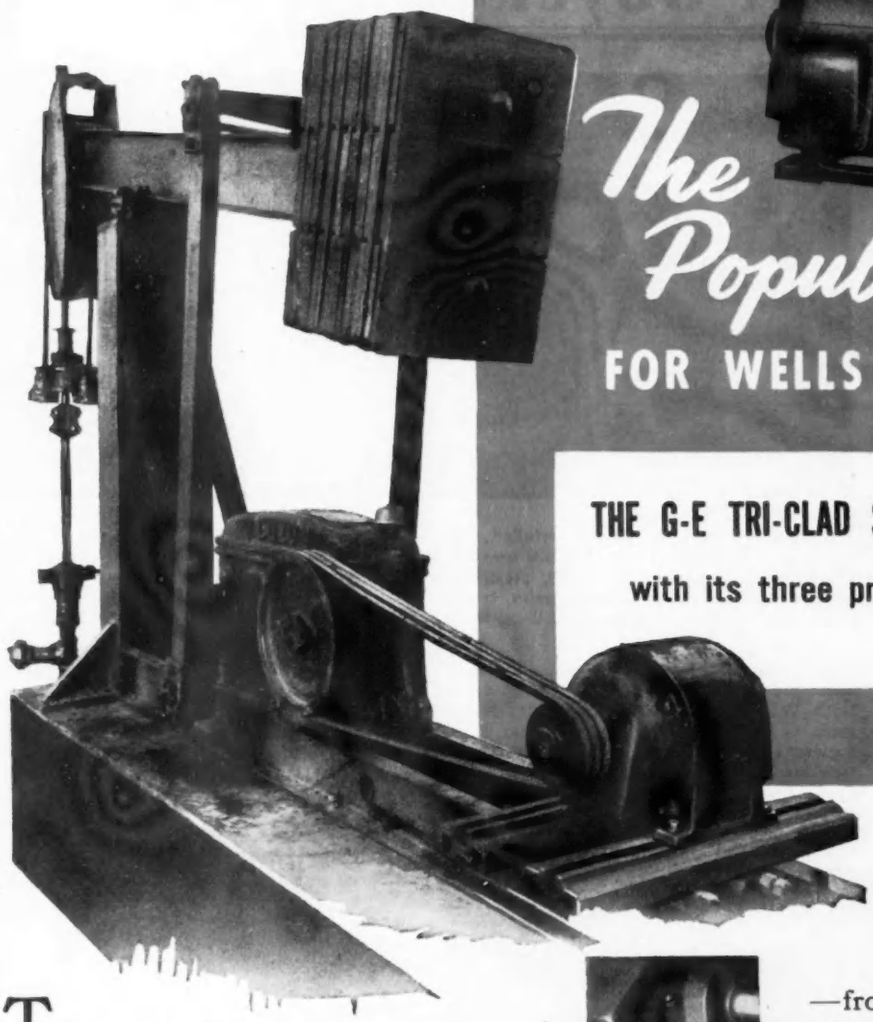
HOUSTON, TEXAS
916 S. PETERS STREET
NEW ORLEANS, LA.



The Popular Choice

FOR WELLS ON THE BEAM—

THE G-E TRI-CLAD SPLASHPROOF MOTOR,

with its three protection features

Protected

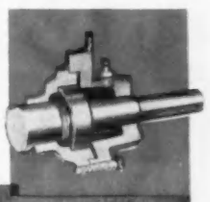
THIS motor will give you long and dependable service under your tough operating conditions. Its clean-cut design and convenience features make it easy to install and maintain.

Or, for those conditions where a completely enclosed motor is required, the G-E totally enclosed fan-cooled motor will provide faithful, uninterrupted operation in all kinds of weather, with little care.

To help you plan your maintenance program, our handy booklet on the care of G-E Tri-Clad splashproof motors gives part-by-part inspection and cleaning procedure. Call or write our office for Bulletin GEJ-910, "Servicing Splashproof Motors Installed Out-of-doors." For general information on the splashproof motor, ask for Bulletin GEA-3595. *General Electric Company, Schenectady, N. Y.*

—from physical damage by one-piece, cast-iron frame and end shields, well-baffled ventilating openings, and waterproof conduit box.

—from electrical breakdown by coil windings of Formex* wire and an external coat of Glyptal No. 1201-B Red for high dielectric strength.



—from operating wear and tear by completely enclosed ball bearings of high load-carrying capacity, effectively sealed to keep out liquids.

*Reg. U.S. Pat. Off.

GENERAL ELECTRIC

750-211-8050

Every week 192,000 G-E employees purchase more than a million dollars' worth of War Bonds.

Notes for the Equipment Buyer and User

Lane-Wells Gun-Perforates 50,000th Well

Lane-Wells Company and Cities Service Oil Company officials were present as witnesses when the former company performed its fifty thousandth gun-perforating job, at one of the latter company's wells in the Oklahoma City field. The event also celebrated the beginning of Lane-Wells Company's twelfth year of gun-perforating operations.

Witnessing the event were Walter T. Wells, chairman, and Rodney S. Durkee, president, of Lane-Wells Company, and Earl Ives, H. O. Harder, D. B. Dow and Fred Lichtenheld of Cities Service Oil Company.

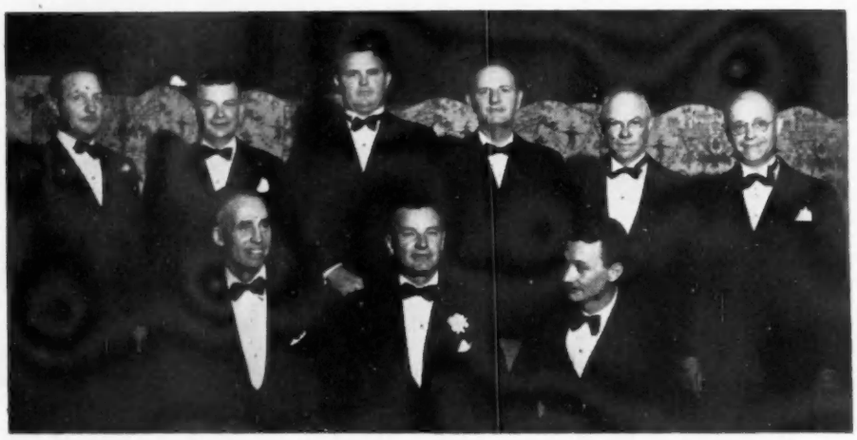
Frick-Reid Exclusive Distributor Of Jones & Laughlin Pipe

Jones & Laughlin Steel Corporation and Frick-Reid Supply Corporation have joined forces in enlarged offices in the Oil & Gas Building at Houston, Texas.

This is made possible, an announcement said, by the recent appointment of Frick-Reid as exclusive distributor of Jones & Laughlin oil-country tubular goods east of the Rocky Mountains and is in line with the policy to consolidate parent and subsidiary company offices in order that a more direct service may be maintained for their respective trades.

The Frick-Reid Supply Corporation organization, under H. H. Wilson, vice president, formerly maintained offices on Quitman Street, where its store and warehouse are located. Moving to town with Wilson are C. B. Moore, city salesman, G. S. Emerson, salesman, and T. L. Lewis, who recently joined the organization as district manager of tube sales. G. E. Tyson, salesman, and J. T. Batchelor, chief clerk, formerly in tube sales for Jones & Laughlin Steel Corporation, have been appointed to those positions with Frick-Reid.

F. D. Winslow, district sales manager for Jones & Laughlin Steel Corporation, continues in charge of sales on mill products, other than oil-country tubular goods.



Los Angeles Chapter of Nomads installed new officers at a dinner-dance meeting at the Biltmore Hotel on February 5. Pictured above are the officers installed, left to right, sitting: Henry W. Pullman, regent; Roland E. Smith, president; Wilbur F. Bettis, regent; standing: Wallace A. Sawdon, vice president; Elmer R. Smith, treasurer; Thomas M. Johnson, deputy sergeant-at-arms; Fred Tylor, assistant treasurer; William McGraw, sergeant-at-arms; John C. Ballagh, secretary.

Hanlon-Waters, Incorporated, executives receiving the Army-Navy E Award for excellence in production of pumping units for the Army's famed "portable pipe lines" now being used in battle zones around the world. Left to right, M. F. Waters, company president; Col. H. A. Montgomery, who made the presentation on behalf of the Army; Capt. E. L. Woodside, the Navy's representative at the ceremony; Col. Francis J. Wilson, Commanding Officer of the United States Engineers, Tulsa area; and E. I. Hanlon, chairman of the board of directors of Hanlon-Waters, Inc.

Worthington Gets Renewal Of Army-Navy E Award

Worthington Pump and Machinery Corporation Harrison, New Jersey, has been awarded second and third star renewals of the Army-Navy E for continued excellence in production of war materials and equipment.

"Powder Metallurgy"

Keystone Carbon Company, Saint Marys, Pennsylvania, has published a new 32-page booklet on "Powder Metallurgy" covering the latest applications of powdered metal parts.

Of particular interest to companies investigating the possibilities and advantages of parts produced by this method are the designers aid section and table on engineering properties. Types of design and specifications for standard forms as well as intricate shapes are presented in detail.

The second section of the booklet is devoted to porous bronze bearings, porous iron bearings and graphite impregnated brass bearings.

Metals

The Steel Improvement & Forge Company, Cleveland, Ohio, has published a reference data book on "The Improvement of Metals by Forging."

Employing charts, photographs and detail drawings, the book presents 36 pages of factual working information. It contains a fund of easy-to-find technical data on types of forgings, forging design principles, forging processes, the metallurgy of forging, and a section devoted to metal specifications and physical properties of various widely-used steels.

Used Oil Field and Industrial Equipment

•

Casing and Line Pipe

•

Drilling Equipment

•

Valves, Flanges, Swages, Fittings *and* Couplings

•

Casing Pulling *and* Shooting

•

Pipe Straightening, Testing, Machine Work

•

Rental Service:
Equipment *and* Tools, Drill *and* Line Pipe, Tongs, Slips, Spiders, etc.

SPECIAL

12 x 12 Gardner-Denver Twin Cylinder Engine Model E. A. 1000 — Slide Valve — Fully Enclosed — On Skids.

15¼ x 7¾ x 20 Gardner-Denver Mud Pump Model F. B. — Slide Valve — On Skids.

14½ x 7¼ x 20 Gardner-Denver Mud Pump Model E. L. — Slide Valve — On Skids.

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HOUSTON 1, TEXAS

When you're in Pittsburgh STOP AT *the*

POPULAR WITH *War-Busy* OFFICIALS

HOTEL PITTSBURGHER

Hub of Pittsburgh war activity—headquarters for the Nation's "Busy People", the big, *new* PITTSBURGHER is more than ever 1st choice of men and women who want to get things done!

400 OUTSIDE ROOMS
ALL WITH BATH & RADIO

Singles $3.30 to $4.40 **Doubles $5 to $6.50**

A KNOTT HOTEL | Jos. F. Duddy, Mgr.

Official U. S. Navy Photo

Violent Sea Action!

"Sure Kill" of a Nazi sub is depicted in this remarkable close-up of a U.S. bomber attack against a Nazi wolf pack. One bare-legged Nazi stands in awe as another ducks. Arrow points to depth bomb about to hit water.

Buy more War Bonds and help kill the enemy wolves!

THE GARLOCK PACKING COMPANY
PALMYRA, NEW YORK

Tulsa, Okla. Houston, Texas Los Angeles, Calif.

Photo at left shows a set of Garlock CHEVRON packing and a single Chevron ring. Chevron is one of the many Garlock packings being supplied to the U.S. Armed Forces and war industries.

GARLOCK

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VALENTINE
To Your Boiler
SAND-BANUM!

It Removes and Prevents Scale and Corrosion While Your Equipment Operates

"The Entirely Different Boiler and Engine Treatment"

Enjoy Automatic Economy and Maintained Efficiency.

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WESTERN SAND-BANUM COMPANY
Houston, Texas Fresno, California
and at other convenient points including leading supply houses

Export Representatives
PETROLEUM MACHINERY CORP.
30 Rockefeller Plaza New York City 20

In LOS ANGELES

It's
HOTEL
CLARK

Nearest downtown hotel to HOLLYWOOD

WITH the movie capital of the world and western America's radio city within the borders of Los Angeles, entertainment reaches its zenith. Gay nights, laughter and life; sunny days filled with thrills and excitement. In the center of everything is situated the HOTEL CLARK at Fifth and Hill Streets. A hotel where you will enjoy hospitality to its fullest extent; where you will find your every wish anticipated. Whether you stay in Los Angeles for a few days or a month, choose Hotel Clark, downtown in the heart of things.

555 Rooms with Baths from $2.50

"Famous for Good Food from Coast-to-Coast"

Men in the Industry's News

ANTHONY GIBBON, former oil operator and former oil editor of the Houston Press, has joined the editorial staff of The Oil Weekly, as district editor in charge of Oklahoma-Kansas. He will make his headquarters at Tulsa.

FRANK B. TAYLOR, for the past seven years district editor at Tulsa for The Oil Weekly, has joined Brooks-Wilson Advertising Agency, Tulsa, as vice president in charge of engineering and technical research. His new duties will include the making of surveys in the industrial equipment field.

WILLIAM O. WILSON has been appointed commercial vice president of Worthington Pump and Machinery Corporation, with headquarters at Chicago, in general supervision of all Worthington commercial activities in the Chicago, St. Louis, Kansas City and St. Paul district offices. Wilson has been with the company and its predecessors since 1898 except for a two-year period starting in 1911.

E. W. LOUDEN, formerly in the production engineering department of The Pure Oil Company, has joined Baroid Sales Division of National Lead Company as division engineer at Houston.

EDWARD BALTUSAITIS, Gulf Refining Company, Saginaw, has been elected president for 1944 of the Michigan Geological Society. He succeeds George Lindberg, Sun Oil Company, Toledo, Ohio. Other new officers are Raymond Hunt, Mt. Pleasant, vice president; Tom S. Knapp, Chartiers Oil Company, Mt. Pleasant, secretary-treasurer, and Lee S. Miller, State Geological Survey engineer, Lansing, business manager.

R. E. KNIPE has been transferred from Kentucky, as chief of the Michigan geological division of The Ohio Oil Company, succeeding W. A. Thomas, who recently was commissioned a major in the Army. Knipe was transferred from Ohio's Kentucky division.

HERSCHEL J. WOOD has been appointed as southwestern representative of Lebanon Steel Foundry, with headquarters at 1505 Commerce Building, Houston.

WILLIAM J. CREIGHTON has been made executive vice president of Jones & Laughlin Steel Corporation, Pittsburgh, and Adam J. Hazlett appointed general manager of sales. Creighton entered the employ of the company as a clerk in 1900 and became financial vice president in 1928 when he was elected a director of the corporation and a member of its executive committee. Hazlett, after graduation from college, was employed by West Penn Steel Company in the sales department, later became sales manager and then president of Eastern Rolling Mill Company, and came to Jones & Laughlin Steel Corporation in 1938 as manager of strip and sheet sales.

W. J. Creighton

A. J. Hazlett

R. L. AGEE has been appointed sales representative in the Texas Gulf Coast and South Texas districts, for Rector Well Equipment Company, with headquarters at Houston. He has been in the oil field specialty and supply business for the past 25 years, formerly operating his own specialty business in Corpus Christi. In the Tampico boom days, he was a driller for Huasteca Petroleum Company, in Mexico.

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